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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

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Monthly Message

These days are filled with arguments among the American Medical Association, the Health Resources Advisory Committee, the three armed services and the Office of the Secretary of Defense as to the proper staffing ratio of medical and dental officers for the armed services. Everyone admits the fallacy in any general over-all ratio. Staffing based on the specific missions is a sounder approach but so far this has been difficult to ascertain; therefore, the acceptable, although more gross, ratio of doctors to troop strength has been adopted.

Pertinent to these arguments, but as yet not fully evaluated, are the studies made in 1952 and 1953 by the National Manpower Council under the auspices of Columbia University. The reports of these proceedings should be required reading for all those interested in the utilization of professional personnel, especially where doctors and dentists are concerned. Not only were the medical, dental, and nursing professions considered, but also the numerous paramedical groups, their supply and potential, in the whole sociological problem of today. Since 1930 we have witnessed an enormous development in aircraft, radar and television industries with comparable expansion in the physical sciences. These have all been added into our active civilization without any subtractions. At the same time during the 1930's, there was a markedly lower birth rate but since 1940 there has been a greatly increased birth rate with great expansions of the infancy and childhood population, and on the other end of life, of the aged, due to our increased health and longevity records. The result is an unusually small increment of the population of the young adult age group with no possibility of expansion for another five years.

We therefore find ourselves faced with an expanded population at both ends of life and also an increased demand by the physical sciences and industry as well as the professions for young adult personnel. This has resulted in competition and has forced us to realize that we must find ways of increased efficiency in utilizing this very limited supply of scientific and professional manpower. From the medical and dental standpoint it means that all of us, both civilian and military, will have to tighten our belts considerably over the next five years until a normal supply of this extremely valuable human commodity again becomes available.

Frank B. Berry

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TRAUMATIC ANEURYSMS AND ARTERIOVENOUS FISTULAS IN WAR WOUNDS

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NORMAN E. FREEMAN, M. D.

THE purpose of this communication is to review the subject of traumatic aneurysms and arteriovenous fistulas, and to present the results of treatment in 31 patients wounded in Korea and admitted to this hospital since August 1950.

A penetrating wound of the arterial wall is the usual factor which produces these lesions, although rarely an aneurysm may result from trauma which merely weakens the arterial wall. Following a penetrating wound of the arterial wall, the extravasating blood, under high pressure, forms a compartment in the surrounding tissue, and in time this compartment is usually surrounded and walled off with scar tissue. Such a cavity, surrounded by a fibrous wall, in continuity with the arterial lumen and containing flowing blood, is known as a false aneurysm, in contradistinction to a true aneurysm in which the wall is composed of thinned but intact arterial wall. When the trauma occurs, if both an artery and a nearby vein should be lacerated, the resulting false aneurysmal sac will communicate with both vessels and transmit blood between them, thus forming an arteriovenous fistula.

By far the most common types of injury producing traumatic aneurysms are missile and stab wounds, and for that reason they are seen much more frequently in battle casualties than in injuries in civil life. Much about the treatment of these conditions has been learned from the experience gained in the past two world wars, and in the Korean conflict.[1-6]

At present, it is generally believed that traumatic aneurysms are best treated by a method which restores arterial continuity because even though a viable extremity is preserved following ligation of major vessels, disability frequently develops due to postoperative arterial insufficiency. At the time of operation, control of proximal and distal portions of the artery is first obtained, following which the aneurysmal sac is dissected from the surrounding tissues and removed. The continuity of the artery is then restored by end-to-end anastomosis or by an artery or vein graft. In patients where dissection of the sac might be unduly

From Letterman Army Hospital, San Francisco, Calif.

TABLE 1. *Arteriovenous fistulas*

Patient	Duration of fistula (months)	Blood vessels involved	Operation	Result	Remarks
1	3	Posterior tibial artery and vein	Quadruple ligation	Good	Fractured tibia; limited duty.
2	15	Posterior tibial artery and vein	Quadruple ligation	Good	Partial loss of foot from gunshot wound. No arterial insufficiency; retired.
3	4	Posterior tibial artery and vein	End-to-end anastomosis	Good	Retired for associated injury.
4	4	Posterior tibial artery and vein	Quadruple ligation	Good	Still hospitalized.
5	11	Anterior tibial artery and vein	Repair artery and vein	Good	Partial peroneal palsy; limited duty.
6	5	Popliteal artery and vein	Transverse repair	Good	Retired for associated head injury.
7	3	Popliteal artery and vein	None	Good	Spontaneous closure; full duty.

TABLE 1. *Arteriovenous fistulas*—Continued

Patient	Duration of fistula (months)	Blood vessels involved	Operation	Result	Remarks
8	4	Popliteal artery and vein	Repair artery and vein	Good	Peroneal palsy; full duty.
9	2	Superficial femoral vein and artery	End-to-end anastomosis of artery	Good	Full duty.
10	3	Internal iliac artery and vein	Quadruple ligation	Good	Full duty.
11	6	Brachial artery and vein	Repair artery ligation vein	Fair	Mild edema; retired.
12	5	Vertebral artery and vein	Quadruple ligation	Unimproved	Horner's syndrome.
	3		Ligation artery	Unimproved	Thrombosis of brachial artery; limited duty.
13	1	Common carotid and internal jugular vein	Repair artery and vein	Good	Full duty.

hazardous, the endoaneurysmorrhaphy as originated by Matas may be used.

The time-honored treatment of arteriovenous fistula is that of quadruple ligation with excision of the fistula. This usually should not be carried out earlier than three months from the date of origin of the fistula, because some small fistulas will spontaneously close and, if they do not, there will have been time for extensive collateral circulation to develop. The treatment of choice, if at all possible is the same as that for traumatic false aneurysm. If, however, an arteriovenous fistula has existed several years, it is usually advisable to carry out a quadruple ligation, because in long-standing cases the artery becomes thinned and arteriosclerotic, making repair difficult and unsafe. The outstanding thing to remember is that proximal ligation of the artery alone should never be done, for then the bypassing collateral arterial circulation will be diverted from the distal tissues back to the fistula, and gangrene of the extremity will almost always result.

Since the outbreak of the Korean conflict, a total of 31 patients with arterial injuries were admitted to this hospital. Thirteen of these injuries were arteriovenous fistulas (table 1). None of these patients had appreciable cardiac enlargement or congestive heart failure. All had a positive Branham's sign. In one patient the popliteal fistula closed spontaneously three months after injury. Of the twelve remaining fistulas, five involving major vessels were repaired, four transversely and one by end-to-end anastomosis; two involving lesser vessels were also successfully repaired. Five were treated by multiple ligation, but following one of these operations the fistula persisted. Five of the patients have returned to full duty; three have returned to limited duty. Four patients were retired; one because of chronic intermittent edema of the arm and three because of concomitant injuries. One patient was still hospitalized at the time of writing.

Eighteen patients with false aneurysms were treated (table 2). Thirteen aneurysms involved vessels of the upper extremity, and five the lower extremity. If diagnosed early, these patients were usually operated on within one or two months after injury. Two patients were operated on within a day or two after admission because the pressure of the expanding hematoma was either causing severe nerve pressure or causing ischemia by occluding the major vessels of the extremity. It was more difficult to restore arterial continuity in these cases, because frequently a long segment of artery was either destroyed or in poor condition. The artery was ligated in five cases. In three instances it was sutured transversely; in nine patients, excision of the aneurysm with end-to-end anastomosis was performed. In one patient a

TABLE 2. *False aneurysms*

Patient	Duration of aneurysm (months)	Artery involved	Operation	Result	Remarks
1	2	First portion of subclavian	Ligation	Fair	Brachial plexus injury; limited duty.
2	1	Axillary	End-to-end anastomosis	Good	Severe brachial plexus injury; retired.
3	4	Axillary	Autogenous vein graft	Poor	Arterial insufficiency on exertion; retired.
4	23 days	Axillary	End-to-end anastomosis	Fair	Severe brachial plexus injury; retired.
5	5	Axillary	End-to-end anastomosis	Good	Brachial plexus injury; limited duty.
6	2	Axillary	End-to-end anastomosis	Good	Severe brachial plexus injury; retired.
7	6	Brachial	Transverse repair	Good	Right amputation below knee; retired.

TABLE 2. *False aneurysms*—Continued

Patient	Duration of aneurysm (months)	Artery involved	Operation	Result	Remarks
8	1	Brachial	Ligation	Good	Median nerve injury; limited duty.
9	2	Brachial	End-to-end anastomosis	Good	Duty.
10	1	Brachial	End-to-end anastomosis	Good	Median nerve injury; limited duty.
11	1	Radial	End-to-end anastomosis	Good	Right amputation at knee; still hospitalized.
12	3	Radial	End-to-end anastomosis	Good	Separation due to hand injury
13	2	Superficial volar arch	Ligation	Good	Severe brachial plexus injury; retired.
14	17 days	Common femoral	Transverse repair	Good	Emergency operation necessary; limited duty.

TABLE 2. *False aneurysms*—Continued

Patient	Duration of aneurysm (months)	Artery involved	Operation	Result	Remarks
15	1	Popliteal	End-to-end anastomosis	Good	Duty
16	15	Popliteal	Transverse repair	Good	Partial loss of foot from gunshot wound.
17	3	Posterior tibial	Ligation	Good	Foot drop traumatic arthritis; retired.
18	3	Anterior tibial	Ligation	Good	Fractured tibia; limited duty.

superficial femoral vein graft was used to bridge a 6.5 cm. defect in the brachial artery.

Three of these patients returned to full duty and six to limited duty. Seven were retired because of concomitant injuries and one was still in the hospital at the time of writing. Two patients in whom end-to-end anastomosis of the brachial artery was done also had severe injuries to the brachial plexus and it is difficult

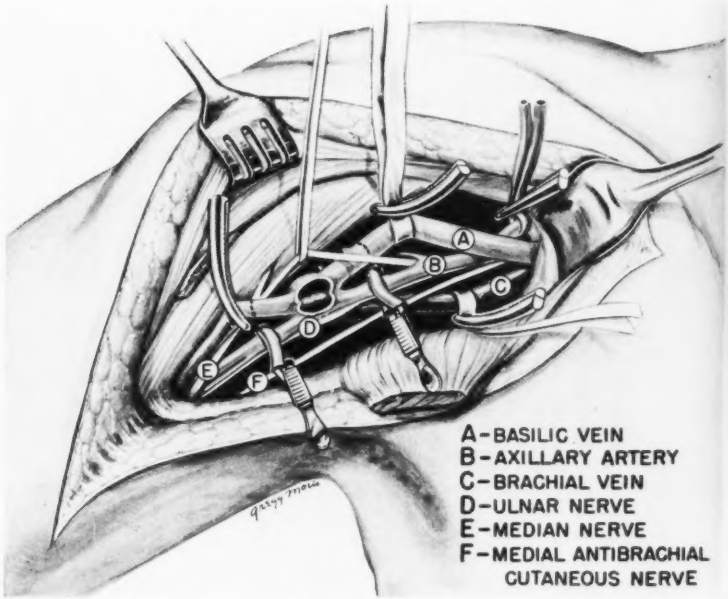

Figure 1 (case 6). Drawing of fistula between brachial artery and basilic vein as seen at surgery.

to evaluate the functional result of the operation from the standpoint of vascular insufficiency. These patients have warm hands which occasionally become cold and slightly blue. One patient in whom an autogenous vein graft was used developed a thrombosis and after a trial of duty was retired because of moderate arterial insufficiency in his hand.

During the early part of World War II, the majority of arteriovenous fistulas were treated by quadruple ligation and the aneurysms by aneurysmorrhaphy, preceded or followed by sympathectomy if an extremity was involved.[7] For example, arterial continuity was restored in 2.7 percent of the first 150 patients treated by Shumacker and Carter,[4] whereas this was accomplished

in 52.7 percent of a later group of 55 patients. Freeman,[3] at the same time, found that in 23 cases in which major vessels of the lower extremity were involved a large proportion of those ligated had vascular insufficiency, whereas only a small number with restoration of the vessel had insufficiency. This has been a rather constant finding (table 3).

A number of important points in the operative management of these patients should be kept in mind. The incision should al-

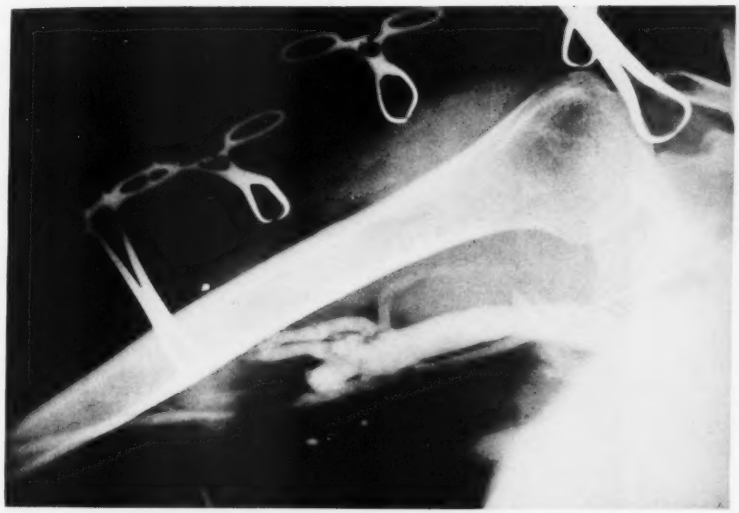

Figure 2 (case 6). Arteriogram demonstrating fistula between brachial artery and basilic vein.

ways be adequate, and, in order to avoid the formation of contractures, should never cross flexion creases. Proximal and distal control of the main arteries should be obtained prior to entering the aneurysm or fistula. In some cases a tourniquet may occasionally be used in the distal extremities if the collateral circulation is good. Every attempt should be made to preserve collateral vessels. A sterile stethoscope should always be available to aid in the localization of the fistula and to rule out the presence of multiple arteriovenous fistulas. A heparin sodium saline solution is used to irrigate the artery periodically to prevent thrombi from forming and to keep it moist. The type of suture used is an everting continuous mattress stitch reinforced by a continuous over-and-over stitch. Usually three or four such sutures No. 00000 silk are needed for an end-to-end anastomosis. The peripheral nerves must be carefully protected and, if previously damaged, neurolysis or neurorrhaphy carried out.

TABLE 3. *Ligation versus restoration of artery*

Author	Major vessel involvement	Ligation	Postoperative vascular insufficiency	Restoration	Postoperative vascular insufficiency
Seeley and associates[6]	93	27	8	66	4
Gerbode and associates[5]	24	13	7	11	2
Heringman and associates[8]	44	36	13	8	0
Freeman[3]	23	12	9	11	2
Winn and associates (present article)	17	2	1	15	2

CASE REPORTS

Case 6. This patient had been wounded in Korea on 20 September 1951 by multiple mortar fragments which entered both arms, the left side of the neck, and the chest. In October 1951, he

Figure 3 (case 17). Preoperative arteriogram showing aneurysm of popliteal artery and fistula between posterior tibial artery and vein.

noted a buzzing sensation in his right upper arm associated with shocklike sensations shooting down into his hand. He had a continual murmur and palpable thrill over the medial aspect of

the upper right arm just distal to the axillary fold without any evidence of paralysis. The right radial pulse was of good quality. Five months after injury, the axilla and arm were surgically explored (fig. 1). An arteriogram was performed under direct vision

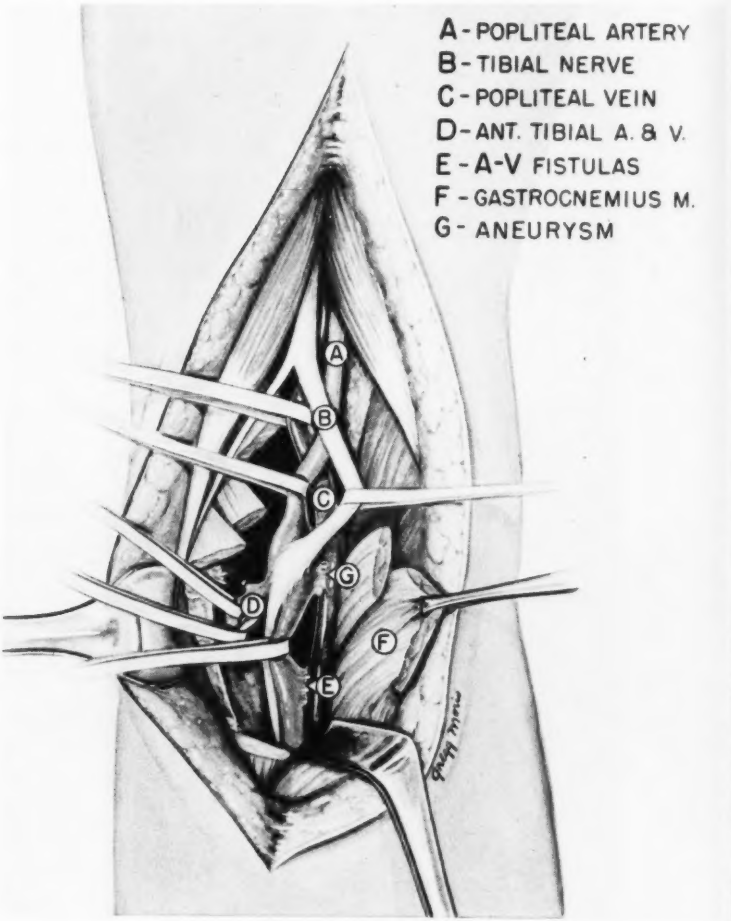

Figure 4 (case 17). Drawing of false aneurysm of popliteal artery and fistula between posterior tibial artery and vein.

which showed the fistula between the brachial artery and the basilic vein (fig. 2). The artery was repaired by transverse suture and the vein was ligated. Postoperatively, the radial pulse was of good quality but the patient noted intermittent edema of his right arm. After a trial of duty he was retired from the service.

This case demonstrates that wherever possible it is advisable to repair the vein also.

Case 17. This patient had been wounded in Korea on 21 November 1952 by grenade fragments which caused multiple penetrating

Figure 5 (case 17). Postoperative arteriogram showing site of repair of popliteal artery and absence of posterior tibial artery.

wounds of the lower extremities. These resulted in amputation of the fourth and fifth toes of the right foot. He was returned to limited duty in April 1952 although he still had swelling and

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aching of the left calf. The swelling did not diminish with elevation or bed rest. Diagnoses of thrombophlebitis and varicose veins were considered until an alert physician made a stethoscopic examination of the left calf and discovered a continual murmur. He was transferred to this hospital where arteriography revealed an aneurysmal out-pouching of the left popliteal artery and an arteriovenous communication between the posterior tibial artery and vein (fig. 3). In December 1952, the popliteal artery was reparied by transverse suture and the arteriovenous fistula treated by quadruple ligation (fig. 4). Postoperatively, the dorsalis pedis pulse remained strong and no evidence of arterial insufficiency developed. Postoperative arteriograms showed a patent popliteal artery (fig. 5).

This case reveals the necessity for auscultation in all extremities which have sustained penetrating wounds. Failure to listen with a stethoscope to this patient's calf resulted in long delay in the proper treatment of his arterial injuries. Arteriography was of value in showing the presence of lesions of both the popliteal and posterior tibial arteries. Ligation of the lesser vessels of the lower leg in young adults can be performed without risk to the circulation of the extremity.

SUMMARY

In 31 patients treated for arterial injuries from combat wounds, 15 of 17 major vessels have been repaired with resultant vascular disability in only 2 cases. Restoration of vascular continuity is the treatment of choice for both traumatic false aneurysms and arterial venus fistulas. In the latter, both veins and arteries should be repaired when possible.

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MANAGEMENT OF TUBERCULOSIS IN CHILDREN

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MANAGEMENT of tuberculosis in children of servicemen presents numerous problems not entirely soluble by nonmilitary standards. The methods used in screening patients, pursuing contacts, conducting mass surveys, establishing a positive diagnosis, initiating well-integrated and controlled therapies, and obtaining specific long-term follow-up observations, all must be correlated and continually modified to meet the demands of the military situation.

This report reviews the results of our experiences in the past 60 months, analyzes methods that have contributed to our difficulties, and offers suggestions for improvement in the treatment of tuberculosis in children, especially at the station hospital level. No attempt has been made to review the extensive literature, to compare results or statistics, to enter into discussion of pathogenesis of tuberculosis in children, or to agree or disagree with current concepts relative to drug therapy.

During the 60-month period, from 1 January 1948 through 31 December 1952, 83 children, with an average age of 36.3 months, were admitted to this hospital for observation or treatment for tuberculosis. Three of the children were admitted twice, making a total of 86 admissions (table 1). Two of these were a brother and sister who showed disease progression at home and were readmitted for additional therapy. The other had cervical adenitis and was readmitted for tonsillectomy; the tonsils showed tuberculous granuloma. One 10-year-old child, included in the group with confirmed tuberculosis, had bronchiectasis secondary to healed tuberculous lesions.

Because servicemen are continually taught and generally understand the necessity for regular physical examinations for self and family, we should expect less advanced tuberculosis in their children than in a nonmilitary population of comparable size.

From Fitzsimons Army Hospital, Denver, Colo. Capt. Berrey is now assigned to Brooke Army Medical Center, Fort Sam Houston, Tex.

Many children were transferred from other military hospitals, often after a parent had been admitted with tuberculosis. Usually the child with tuberculosis had been treated without a planned therapeutic regimen or had had no treatment. The early use of streptomycin without a specific therapeutic plan has resulted in difficulty of obtaining a positive culture later. Accuracy of transfer diagnosis is an important problem because transportation is costly. The fathers of some of the 15 children, who were admitted with a diagnosis of tuberculosis (table 1), which was not substantiated, were unnecessarily transferred to this area. Often children who were not acutely ill, arrived without their hospital records for direct admission rather than for transfer. Inquiry into the history, specific treatment received, laboratory findings, and the roentgenographic trend disclosed that the parents were uninformed and were only concerned whether or not their child

TABLE 1. *Admission diagnoses of 83 patients**

	Number of patients
Admitted with diagnosis of tuberculosis	
Confirmed	62
Not confirmed	15
Admitted with healed tuberculous lesions with bronchiectasis	1
Admitted with other diagnoses	
Tuberculosis confirmed	3
Admitted for observation	
Tuberculosis confirmed	2
Total	83

*Three patients were admitted twice.

had tuberculosis. Reduplication of all examinations or waiting for clinical records from previous installations involved costly hospitalization. The child's health may be jeopardized if chemotherapy is delayed until such information is obtained. Material from gastric washings and urine for culture was obtained from all patients on admission. Treatment was not delayed, however, until the results of these tests were reported if other evidence supported the diagnosis of tuberculosis.

GENERAL OBSERVATIONS

About 77 percent of the contacts were known or suspected of having tuberculosis (table 2). Suspected contacts were household servants in foreign countries where the children had lived

(Germany, Alaska, Japan, and Trieste, all areas of high tuberculosis incidence). The diagnosis of tuberculosis was subsequently confirmed in the mother, father, or a close relative of 52 patients. Thirty-four (20 mothers and 14 fathers) of this latter group have been treated at this hospital.

TABLE 2. *Observation of patients' contacts**

Contact	Number	Number under treatment
Mother	28	20
Father	15	14
Relatives	9	unknown
In foreign country	10	unknown
Friend	2	unknown
Unknown	19	unknown
Total	83	34

*Primary contacts of 83 patients with 86 admissions, not including three double contacts. One mother was the contact for five children and two mothers were the contact for two children.

The average duration of hospitalization, including 24 patients who remained on the ward as of 31 December 1952, was 162.3 days.

The types of tuberculosis encountered are given in table 3. Pulmonary lesions were most frequent and miliary and miliary-meningeal tuberculosis were the next greatest single group.

SYMPTOMS AND PHYSICAL FINDINGS ON ADMISSION

Twenty-seven patients with tuberculosis were asymptomatic (table 4). The positive roentgenographic evidence of the disease was obtained as a result of the contact survey. Only 18 of the 44 symptomatic patients had specific symptoms (cough, wheeze, pain, night sweats, fever, coma, or convulsions). Primary tuberculosis is more often than not free from specific signs and symptoms and complete examination of those children in whom tuberculosis is suspected is important. Only 50 patients had detectable physical findings on examination.

Diagnostic procedures at this hospital included a detailed history searching for contacts and past respiratory infections, an intracutaneous tuberculin test, complete blood count, sedimentation rate, urinalysis, and a roentgenographic examination. Three fasting gastric washings and a 24-hour urine specimen were secured for culture for acid-fast bacilli.

TABLE 3. *Types of tuberculosis encountered in 83 patients*

Type of tuberculosis	Number of patients	
Primary		38*
Nonprogressive	33	
Progressive	3	
Pleural effusion	1	
Elbow involved	1	
Reinfection with spine involvement		1
Miliary		7
Femur involved	1	
Fibula and spine involved	1	
Spine involved	1	
Meningeal		10
Miliary spread	5	
Pulmonary involvement	1	
Pulmonary and spine involvement	1	
Pulmonary and endobronchial		6
Cervical glands		2**
Pleural effusion		2
Bronchiectasis secondary to tuberculosis		1
Nontuberculous bronchiectasis		1
No disease		15
Total		83

*Two children had two admissions each.
**One child had two admissions.

TABLE 4. *Symptoms on admission*

	Patients with proved tuberculosis	Patients without tuberculosis
Without symptoms (patients obtained through contact surveys)	27	4
With symptoms	44*	11
Total	71	15

*Three patients with tuberculosis had two admissions.

LABORATORY FINDINGS

Positive cultures for tuberculosis in children have often been sought but infrequently found. Nineteen of the children with positive roentgen evidence of primary disease and positive tuberculin reactions had positive cultures or positive guinea pig inoculations. Many pediatricians believe there is no reason for isolation and treatment of the uncomplicated disease in children. However, a child was infected by someone with tuberculosis and although he usually expectorates very little, he swallows great quantities of sputum, and may spread the disease through oral contacts. If coughing is present he certainly should be kept under closer surveillance in order to decrease the likelihood of dissemination to others.

The erythrocyte sedimentation rate was used as one index of activity. Elevated sedimentation rates (Wintrobe, corrected) were present in 38 of the 83 patients. Positive urine cultures were not obtained on any patient.

TABLE 5. *Results of tuberculin skin tests*

Patients with diagnosis	Tuberculin skin test			Total
	Positive	Negative*	Not recorded	
Active tuberculosis**	66	3	2	71
No tuberculosis	1	14	0	15
Total	67	17	2	86

*Negative to second strength tuberculin (0.005 mg.).
**Three children had two admissions each.

Results of tuberculin skin tests are noted in table 5. Fifteen patients were admitted (directly or by transfer) with the diagnosis of tuberculosis; the tuberculin test was subsequently negative and no active disease could be demonstrated. If a child is suspected of having the disease, the investigating physician should do and interpret the tuberculin skin test, preferably using the purified protein derivative (PPD first strength = 1:10000, O. T.). The patch test is subject to a wide range of variation in interpretation and is not advised.

Only three children who were definitely considered to have tuberculosis had negative tuberculin skin tests. Also, in two patients tuberculosis was demonstrated when a tuberculin test had not been done or the results not recorded.

Failure to recover acid-fast bacilli has not deterred us from treating any child who had contact with a tuberculous patient, a

positive tuberculin skin test, and whose chest roentgenograms showed evidence of the disease. Lichtenstein and Bettag[1] offer rather convincing arguments to the contrary. Failure to treat these children may invite disaster, however, through increased pulmonary or endobronchial spread with hilar node erosion resulting in miliary dissemination including meningitis. Early adequate chemotherapy does not stop all progression, but it may prevent disastrous spreads in many instances. Once therapy was initiated in a child with miliary disease meningitis did not develop. Adequate posttreatment follow-ups in these children present problems consequently, definitive treatment is initiated in practically all children.

PSYCHOLOGIC FACTORS

It is important that the hospital meet the child's needs for parent figures as completely and naturally as possible because as Langford[2] indicated, prolonged hospitalization and separation from the home situation are almost sure to leave an indelible mark on the child. Visiting rules are being relaxed in an effort to bring the children and parents together more frequently.

Play periods were provided and children with tuberculosis of a similar degree played together. The performance of tasks, responsibilities, school work, and other activities was encouraged within limits of the child's well-being. Kind, affectionate, and industrious professional and nonprofessional personnel staff are needed on the pediatrics ward. Such persons are the ones who help the children to speak (masks worn by personnel may create a serious handicap to proper speech development), who drop in for play, and who provide surprises they will enjoy and expect. All but the more seriously ill children entered into this atmosphere almost immediately after admission to the hospital.

The occupational therapists were invaluable in carrying forward many of these extracurricular activities. Daily supervised play periods permitted better socialization among the children. Rest periods became quieter and breakage of toys, windows, window shades, et cetera, decreased in direct proportion to the availability of such activity.

A qualified teacher was obtained and classes were conducted five days a week for children of school age.

The Volunteer Gray Ladies were most welcome because they always were helpful in this program.

COMPLICATIONS

Complications were few and developed in only three patients during their hospitalization: Pleural effusion, which cleared fol-

lowing thoracentesis; obstructive emphysema, which cleared immediately following bronchoscopy; and a retropharyngeal abscess which was cured by treatment.

Treatment complications, consisting of eighth nerve deafness and vestibular involvement, occurred in five patients. These cleared promptly on cessation of the drug. Two children were retreated, without further recurrence, after a rest period.

Complications that developed prior to admission included all those tuberculous lesions not specifically limited to the lung parenchyma (excluding enlarged hilar nodes). Endobronchial disease which was diagnosed only on bronchoscopic examination, was noted in six patients on admission. It was likely present in more children, but went undiagnosed because bronchoscopic examination was omitted unless evidence of obstruction was present. The endobronchitis cleared in all patients with the administration of streptomycin and para-aminosalicylic acid. Only one patient had evidence of residual damage. The right middle lobe orifice could not be visualized in this child and a lobe resection at a later date may be necessary.

Bronchoscopy requires the skill of a well-trained bronchoscopist and even then is a formidable procedure.[3] On two occasions, laryngeal edema with stridor developed as a sequela and was promptly relieved each time by steam inhalation. If obstruction is present, therapeutic bronchoscopy, as frequently as indicated, is justified. If the roentgenograms show progression of the disease, bronchoscopic examination should be done. No attempt was made to modify the selected treatment protocol because of the presence of endobronchial disease, and results were gratifying.

METHODS OF THERAPY

There is a close relationship between the pediatric and the tuberculosis sections of the medical service in the therapeutic management of children with tuberculosis. Each new admission was presented by the pediatric section to the tuberculosis therapy board, and a joint decision was arrived at concerning therapy. This joint board also rendered decisions on changes in treatment protocol, discontinuance of therapy, and disposition of each pediatric patient. Both services found this arrangement mutually beneficial; it provided an opportunity for the phthisiologists to observe pediatric problems, and afforded the pediatrician a ready contrast with the problem of tuberculosis in adults. It further enabled the application of newer advances in chemotherapy as they were reported.

Many varieties of therapeutic management were used during the 60 months. The combined intermittent streptomycin—para-amino-

salicylic acid regimen was particularly adaptable for treatment of the primary disease in children. A single injection of 0.5 gram of streptomycin every three days was given to children under five years of age; thereafter the dose was increased to 1 gram every third day unless the child was small for his age or developed evidence of toxicity. Para-aminosalicylic acid was given three times daily to tolerance. The daily amount tolerated by a 30-month-old child was about 4.5 grams and 6 grams for a five-year-old child.

In the beginning few children tolerated para-aminosalicylic acid satisfactorily. Small dosage schedules were preferred when treatment was begun with graded increments allowing two to three weeks to reach maximum tolerance levels. Lincoln[4] encountered difficulty in administrating para-aminosalicylic acid and used thiazolsulfone (promizole) in lieu of it. Other routes of para-aminosalicylic acid administration have been attempted when the oral route failed. Intravenous administration is usually limited because of problems attendant to prolonged daily intravenous therapy in small children. Subcutaneous administration has been attempted but induration at the site of injection developed rapidly, despite the addition of hyaluronidase.

MILIARY TUBERCULOSIS AND MENINGITIS

Miliary and miliary-meningitis tuberculosis were treated daily with streptomycin and para-aminosalicylic acid. All patients with miliary disease, except three who were treated early in this series, also had meningitis on admission and the standardized regimen for these children, according to age and size, consisted of a single injection of streptomycin (0.5 to 1 gram) daily and para-aminosalicylic acid to tolerance. Daily chemotherapy was continued until the spinal fluid was normal for two successive months, there was roentgenographic evidence of complete resolution of all miliary lesions and the child appeared clinically well. Combined intermittent treatment was then continued for an additional six months using the protocol for primary disease and was followed by six months of hospital observation.

During the last three months of the survey isoniazid (isonicotinic acid hydrazide) was used to a limited degree.

It was in the management of meningitis that our protocol departed most widely from the program used in many pediatric centers. Intrathecal medication was not used, except in one patient early in this study. Streptomycin levels in the cerebrospinal fluid abode 10 μg. per cc. was obtained by intramuscular administration of the drug and a close correlation was shown to exist between this therapeutic level and the progress of recovery. Of the utmost importance was continuation of the treatment for an

adequate period of time, best determined by clinical and laboratory evidence.

During the final six months' observation in the hospital monthly blood counts, sedimentation rates, roentgenograms, and spinal fluid examinations were completed. If a reversal in clinical or cerebrospinal fluid findings occurred, daily treatment was reinstituted and continued until again normal for two successive months.

DISPOSITION AND FOLLOW-UP CARE

Disposition of patients admitted are tabulated (table 6). On the last day of this study, 24 patients remained in the hospital, none of these were repeat admissions. The other 62 admissions had been disposed of by various discharges; 54 were discharged with maximum hospitalization benefits (including 15 who did not have tuberculosis). Three patients were transferred elsewhere, two (one died later) to a local sanatorium after the parent had been separated from the service, and the third was transferred to a nearby station hospital at the father's request. Two went home, against advice; one because the father had a permanent change of station, the other due to a lack of understanding the seriousness of tuberculous lymphadenitis.

TABLE 6. *Disposition of 83 patients*

Discharged with arrested tuberculosis		39
Tuberculosis not proved		15
Transferred elsewhere (one died after transfer)		3
Returned home against medical advice		2
Died in hospital		3
Remained in hospital		24
Receiving treatment		
Miliary and/or meningeal	6	
Pulmonary	14	
Posttreatment	4	
Total		86

*Three patients were admitted twice.

The status of patients with miliary and/or meningeal tuberculosis is shown in table 7.

All four deaths occurred in patients with meningitis and three of them occurred early in this study. One patient was admitted in a terminal state and lived only one month. Another, hospitalized

over two years, had arrested miliary and meningeal tuberculosis and died of inanition and pneumonia, but no evidence of active tuberculosis could be demonstrated at autopsy. The third patient had a sudden onset of the disease and rapidly deteriorated despite the use of intrathecal streptomycin therapy (the only patient in this series to receive continuous intrathecal streptomycin). The other patient, a two-year-old girl, died in a local sanatorium seven months after transfer. The mortality rate of the 83 patients in this series was 4.6 percent while the corrected mortality rate for those with tuberculosis (excluding five patients who were lost to observation) was 6.35 percent compared to 23.5 percent for those who had miliary or meningeal involvement.

TABLE 7. *Results of miliary and/or meningeal tuberculosis in children*

Status of patient		Number of patients
Died (one after transfer)		4
Discharged from hospital		8
Less than 1 year	3	
From 1 to 2 years	2	
No follow-up after 12 months	3	
Remaining on ward		5
Disease not active		
Less than 1 year	2	
From 1 to 2 years	1	
Disease active		
Less than 6 months	2	
Total		17

Of the 39 patients discharged with tuberculosis only 24 were followed from one month to two years and all have remained well. Long-term follow-ups are most valuable and necessary to gain information relative to the development of pulmonary tuberculosis in adolescence, as well as a guide for interpreting subsequent changes, either clinical or roentgenologic.[5] There were no relapses known to us except in the three children described who were readmitted because of progression of the disease at home. All three readmissions were successfully followed after the first discharge prior to readmission.

One of the reasons why long-term follow-ups fail in the military service is because the father of the patient gets a permanent change of station necessitating the child going with the parents. Another is that one parent (usually mother) is in the hospital and the father must send the child to the grandparents. Occasionally,

the father is discharged from the service during or after his child's illness and such children are almost invariably lost to follow-up care.

The stability of permanent community life is often denied the serviceman, which adds to the difficulties for providing optimum home care, especially if one parent is hospitalized for tuberculosis. We prefer to treat most children who have had contact with a person who had tuberculosis, have a positive tuberculin skin reaction, and roentgenographic evidence of tuberculosis.

The following case reports are representative of the patients observed and problems encountered.

CASE REPORTS

Case 1. *Progressive primary tuberculosis, endobronchial disease, and atelectasis.* A four-year-old child was admitted on 24 November 1951 as a transfer from a station hospital. Six months before admission to this hospital a roentgenogram of the chest (fig. 1), which was made because a twin sibling died of tuberculous meningitis, was interpreted as showing atelectasis, "not thought to be tuberculous." Two months later she was hospitalized following a head injury. Rales were heard over the right lower chest posteriorly, and a tuberculin patch test was positive. She was discharged and her parents were advised to keep her in bed. Subsequently a roentgenogram showed pneumonia and atelectasis (fig. 2). She was hospitalized and gastric washings were positive for tuberculosis on guinea pig inoculations. She was given streptomycin and para-aminosalicylic acid intermittently for three weeks and transferred to this hospital. On admission positive findings were dullness and decreased breath sounds over the lower anterior chest on the right side.

Sedimentation rate (Wintrobe) was 20 mm. at the end of the first hour. A roentgenogram of the chest showed atelectasis of the right middle lobe and right hilar adenopathy. The first strength tuberculin test was positive. The spinal fluid was normal.

She was continued on 0.5 gram of streptomycin every three days and 1.5 grams of para-aminosalicylic acid three times a day. Bronchoscopic examination five days later showed a penetrating caseous node in the right main stem bronchus obstructing the middle lobe orifice; after suctioning, a small bronchomediastinal fistula was apparent. A rather wide diurnal temperature fluctuation and elevated sedimentation rate continued for five months. Repeated roentgenograms of the chest revealed only minimal clearing of the atelectasis. Bronchoscopic examination showed complete healing of endobronchial disease without obstruction, except that the right middle lobe orifice could not be

Figure 1 (case 1). Roentgenogram taken on 31 May 1951 showing progressive primary tuberculosis with right middle lobe atelectasis. Figure 2 (case 1). Roentgenogram taken on 24 July 1951 on second admission showing extension of the atelectasis. Figure 3 (case 1). Roentgenogram taken on 26 May 1952 at discharge showing some clearing of the atelectasis.

Figure 4 (case 2). Roentgenogram taken on 19 October 1951 showing marked distortion of thoracic cage with evidence of calcium deposition and fibrocaseous disease. Figure 5 (case 2). Roentgenogram of spine taken on 25 March 1952 showing extensive kyphosis. Figure 6 (case 2). Roentgenogram taken on 19 May 1952 after eight months of therapy. Marked clearing of pulmonary lesion had occurred.

visualized (fig. 3). Chemotherapy was to be continued for an additional three to six months and a segmental lobe resection was considered.

Case 2. *Progressive primary tuberculosis with Pott's disease.* A six-year-old boy with marked dorsal kyphosis was admitted on 26 October 1951 to this hospital for evaluation. At the time his mother was a hospital patient with tuberculosis. At 18 months of age when he started to walk he "leaned to the right." One year later a deformity of the spine became obvious and a diagnosis of tuberculosis of the spine was made at a civilian hospital. He was placed in a body cast for six months. Subsequently, a Hibb's fusion operation was done. Following discharge 10 months later, he wore a brace until this admission. He had not received any chemotherapy.

Roentgenograms of the spine showed a well-fused kyphotic spine, with narrowing of the interspaces from D-7 to L-1, and destruction in the vertebral bodies from D-10 to D-12. There was marked deformity of the thoracic cage and extensive pulmonary infiltration at the right cardiophrenic angle (figs. 4 and 5). Sedimentation rate was normal. Initially it was considered that the pulmonary infiltration probably represented fibrotic tissue. However, because he had not received chemotherapy, 0.5 gram of streptomycin every three days and 1.5 grams of para-aminosalicylic acid three times a day were given. Within one month definite roentgenographic evidence of clearing of the pulmonary lesion occurred and has continued (fig. 6). Chemotherapy will be continued until the chest lesion has stabilized.

Case 3. *Tuberculous meningitis and arachnoiditis.* A 15-month-old boy was transferred on 7 August 1951 to this hospital, with a diagnosis of tuberculous meningitis and a history of meningeal irritation for three weeks. His father was in the hospital with tuberculosis and the maternal grandmother had died of tuberculosis in the home when the patient was three months old.

When examined the patient was in a position of flexion-abduction of the thighs with the upper extremities abducted. There was a staring gaze with apparent blindness, nuchal rigidity, and open anterior fontanel without bulging. He was extremely irritable, resisted movement, screamed intermittently as if in pain and had an unsustained bilateral ankle clonus.

The spinal fluid contained 120 cells per cu. mm. (80 percent lymphocytes); glucose, 33 mg. per 100 cc.; chloride, 620 mg. per 100 cc.; and total protein, 5,448 mg. per 100 cc. The roentgenogram of the chest showed miliary tuberculosis, and the first strength PPD tuberculin test was positive. Fluid obtained by a cisternal puncture showed total protein 82 mg. per 100 cc.

and glucose 62 mg. per 100 cc. The patient was given 1 gram of streptomycin and 4 to 6 grams of para-aminosalicylic acid daily. Two weeks after admission a myelography was done and a cohesive arachnoiditis was demonstrated at the level of D-10 (fig. 7). Six days later a laminectomy was performed from D-9 to D-12 to remove the adherent arachnoid tissue. A single intrathecal dose of 75 mg. of streptomycin was given during the operation.

The spinal fluid six months after admission showed a cell count of 36 lymphocytes per cu. mm., glucose 72 mg., and total protein 75 mg. per 100 cc. The total protein and glucose content of the spinal fluid were at normal levels 16 months after admission when this survey closed. The patient was active in bed and able to sit, stand, and feed himself, and had no evidence of blindness or deafness. A roentgenogram of the spine showed a dissemination upward of the initially injected pantopaque (fig. 8), and one of the chest (fig. 9) revealed little evidence of pulmonary infiltration.

Case 4. *Miliary tuberculosis.* A six-month-old infant was admitted on 21 October 1949 to this hospital because of cough, wheezing, weight loss, and increasing anorexia of two months' duration.

His mother was hospitalized with active tuberculosis when he was born. There was no postnatal contact with his mother but he was kept by his maternal grandmother until she died of tuberculosis, when he was three months old. On admission he was a marasmic infant coughing constantly and weighed 10½ lb.

Initial tuberculin skin test (one fourth of first strength PPD) was positive. Cultures of gastric contents for acid-fast bacilli were positive. Spinal fluid on admission and before discharge was normal. A roentgenogram of the chest showed miliary lesions in both lung fields (fig. 10). Streptomycin was given daily for 28 days, discontinued for 28 days, and then resumed for 28 days. Clearing of the miliary spread was apparent two months after admission. Seven months after admission, bronchoscopic examination showed tuberculous bronchitis. Very soon thereafter obstructive emphysema developed in the right side of the chest (fig. 11); which was relieved by bronchoscopic aspiration (fig. 12). Progressive healing continued, and on discharge, nine months after admission, only a calcified right hilar node remained. A follow-up roentgenogram six months after discharge revealed continued healing; he was subsequently lost for continued follow-up.

METHODS OF TUBERCULOSIS CONTROL SURVEY

It is difficult to establish a permanent tuberculosis control program for dependent children at military installations. In the

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Figure 7 (case 3). Roentgenogram taken on 20 August 1951 showing radiopaque material in spinal canal demonstrating level of block. Figure 8 (case 3). Roentgenogram taken four months after operation. Minute deposits of the radiopaque fluid may be seen above the level of block demonstrated in figure 7. Figure 9 (case 3). Roentgenogram taken 10 months after operation.

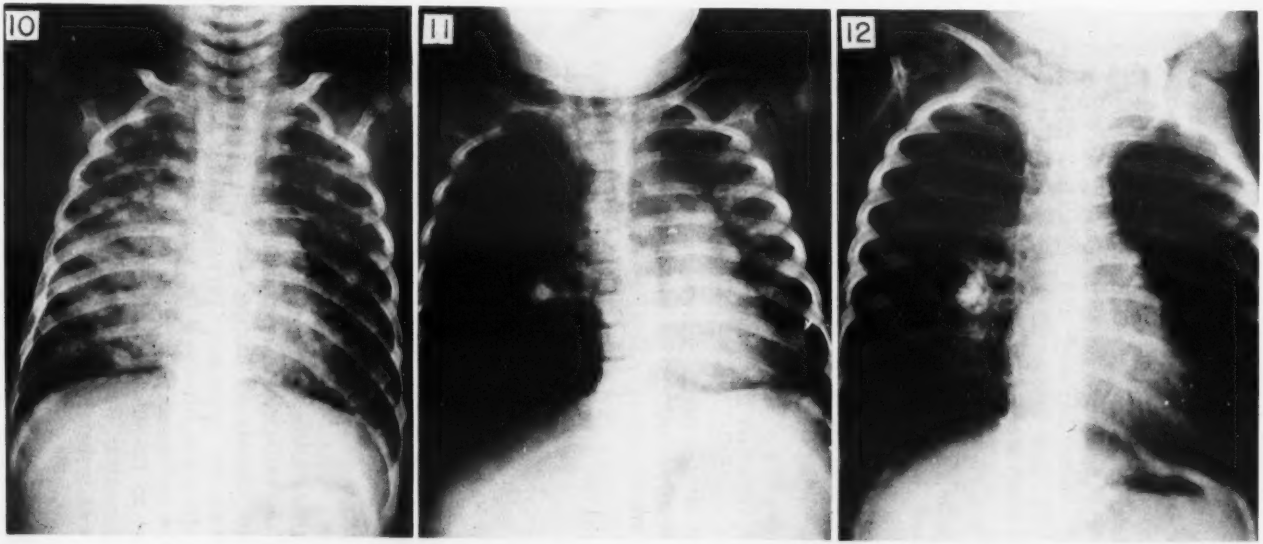

Figure 10 (case 4). Roentgenogram taken on 21 October 1949 showing extensive miliary tuberculosis. Figure 11 (case 4). Roentgenogram taken after seven months of therapy showing large hilar node with obstructive emphysema. Figure 12 (case 4). Roentgenogram taken immediately after bronchoscopy and relief of obstruction.

past, this has been only partially successful during routine clinic visits, summer youth programs, and preschool health examinations. Frequently no specific note was made concerning contact with tuberculosis. All too consistently our past methods did not reach as many contacts as it is possible to reach. Because of this, the following program was adopted at this hospital in September 1952 and appears effective. On 31 December 1952, 161 contacts were being followed and none had developed active tuberculosis. Of this group 22 have positive tuberculin skin tests, four of them were conversions to positive after initiation of the program.

All adult patients with tuberculosis admitted to this hospital are interviewed by the educational nurse and social service worker. Inquiries are made as to whether or not they plan to bring their children to this vicinity. If the children are in the vicinity or are to arrive later their names and addresses are reported to the pediatric section.

Routine tuberculin skin tests of all patients are carried out in the outpatient clinic on the initial visit, and for newborn infants at the end of the first year. Roentgenograms of the chest obtained at this time form an integral part of our health program which is primarily concerned with discovering contacts of patients with tuberculosis.

A card file is kept on all persons in the program chronologically according to the month in which he or she is next due for roentgenographic or other examinations. These follow-up examinations are at three- to six-month intervals.

If a child is to leave the immediate geographic area, the parent is given a "follow-up card" stating the diagnosis, last roentgenographic findings, results of the tuberculin test, and the steps required to secure future follow-up examinations whether in a military or nonmilitary status.

FOLLOW-UP STUDIES

The type of follow-up studies and their intervals are at the discretion of the pediatrician responsible for the program. In general, after the initial evaluation, tuberculin tests are done at regular intervals on negative reactors among known contacts. A change in reaction is cause for further investigation. Roentgenograms and sedimentation rates for positive reactors are repeated at six- to 12-month intervals. Children with tuberculosis are examined monthly for three months after discharge from the hospital then at gradual lengthening intervals. About two years after discharge, they are examined annually. During puberty from 10 to 14 years of age, the children should be examined at six-month intervals.

DISCUSSION

Effective dependent care is essential to troop morale, and at times frequent changes in duty station assignments mitigate against such care. The problem becomes less formidable, however, by localizing the treatment of tuberculosis in children in major army medical centers. Many factors are not exclusively military. Some are in part, a function of the civilian communities such as mass surveys and welfare agencies which direct the proper disposition of eligible military dependents who have suspected or proved tuberculosis.

This hospital has been the tuberculosis center for the armed services for many years and a large number of children with tuberculosis are treated here.

To treat or not treat primary tuberculosis is a debatable question, not yet satisfactorily or completely answered. It is our belief that because of the difficulty in obtaining frequent re-examinations and the ever-present danger of the occurrence of miliary and meningeal dissemination, all children should be treated vigorously, except those who have very minimal involvement.

It would be a difficult task and not worth the effort, to enumerate all children with tuberculosis admitted and disposed of at every medical installation of the armed services for the period outlined in this survey. Furthermore, the methods of diagnosis, treatment, disposition, and follow-up would be equally evasive of satisfactory evaluation. The results at this hospital indicate a useful method of diagnosis, treatment, disposition, and follow-up. They indicate what has been and is being done to lessen the mortality from pediatric tuberculosis in a large Army hospital. These remarks are not to be construed to mean that these methods should be universally used in military installations, nor are they adaptable in every way to these many facilities. Further, the difficulties in the social and economic spheres of the serviceman's home versus the stable home and community life of his civilian contemporary must be carefully evaluated and every available means enjoined to equalize the differences. Co-operation with the social work service must be firmly established to render assistance in enabling the family to better understand the problems and to facilitate the necessary readjustments posed by the disease and attendant prolonged hospitalization.

SUMMARY

During a 60-month period, 83 children were admitted to this hospital for observation or treatment for tuberculosis, and 68 were found to have the disease. Three children were admitted twice. Early diagnosis and adequate transfer records are essential.

Purified protein derivative (PPD) intracutaneous test is easily administered and extremely valuable. Fourteen patients who had not had a tuberculin skin test at the home station were subsequently found not to have tuberculosis. The number of known contacts was high and 34 of the parents of the 83 patients were, or had been, under treatment at this hospital.

Cultures for acid-fast bacilli were positive in less than 25 percent of the patients admitted and an elevated sedimentation rate was present at some time in 40 percent.

Any child who had contact with a person with tuberculosis, a positive tuberculin skin test, and roentgenographic evidence of the disease was treated. The use of the combined intermittent streptomycin and para-aminosalicylic acid regimen is the treatment of choice except for the miliary or miliary meningeal group who received streptomycin and para-aminosalicylic acid daily as outlined and more recently daily isonicotinic acid hydrazide has been added to this program.

Six patients had endobronchial disease, which showed complete healing on bronchoscopic examination. In one of these, the right middle lobe bronchus was never visualized despite clearing of the endobronchial disease.

The occupational therapy section of the physical medicine service as well as the Gray Ladies are integrated into the plan of treatment. This is of inestimable value in aiding the children to progress as normally as possible.

Of the 83 patients, four with meningitis died, five were transferred, 39 were discharged with arrested tuberculosis, 24 remained on the ward at the close of the survey, and no tuberculosis could be demonstrated in 15.

A tuberculosis contact survey and control program was established to facilitate better supervision of the children of tuberculous servicemen or their wives.

Despite the small series, the results are gratifying and it is believed that such a program is adaptable, with local modifications, to any medical installation of the armed services.

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BIOLOGIC TESTS FOR PREGNANCY IN ARMY AREA LABORATORIES

Comments on the Chorionic Gonadotrophin Test With Serum

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THE demand on medical laboratories for biologic tests for pregnancy has increased sharply in recent years. In the armed services this has been due largely to the expiration in 1948 of the Emergency Maternal and Infant Care Program. In the same year internships and residencies in obstetrics and gynecology were established at named army hospitals. The introduction of the frog* tests,[1-4] with their simple technic and speedy results, also contributed to the increased popularity of this laboratory procedure among clinicians.

The responsibility for the performance of most pregnancy tests in the Army belongs to the six army area laboratories in the zone of the interior and to medical general laboratories overseas, in addition to the named army hospital laboratories. In general, the Aschheim-Zondek, Friedman, Hogben and *Rana pipiens* tests are used.

In an effort to develop a uniform method of pregnancy testing throughout the Army, comments and recommendations on this subject from various army area laboratories were requested by the Office of the Surgeon General. The following is a summary of the data obtained.

FIRST ARMY AREA MEDICAL LABORATORY

The First Army Area Medical Laboratory performs the Friedman and male frog tests. The former requires virgin female rabbits and the latter, male Rana pipiens. In the performance of the male frog test, the frog is injected via the dorsal lymph sac with 1.0 cc. of concentrated urine of the patient. (The most widely used

**Xenopus laevis* is considered to be a South African toad by some authorities and a clawed frog by others. The female of this species is used, whereas the male *Rana pipiens* is required for these tests.—*Editor*

From the First, Second, Third, Fourth, Fifth, and Sixth Army Area Medical Laboratories. Maj. Benitez is now assigned to the 97th U. S. Army General Hospital, APO 757, New York, N. Y.

method of concentration is the Cutler modification of the Scott technic.[5] The animal is examined every half hour for three hours for evidence of the presence of sperms in the cloaca. Frogs that exhibit a positive reaction are not used again, but those with a negative reaction can be used again after 24 hours.

The First Army Area Medical Laboratory modifies this procedure. If the specific gravity of the urine is 1.015 or more, 50 cc. are used and diluted to 100 cc. with water; if 1.010 to 1.014, 100 cc. are used. If the specific gravity is lower than 1.010, it is

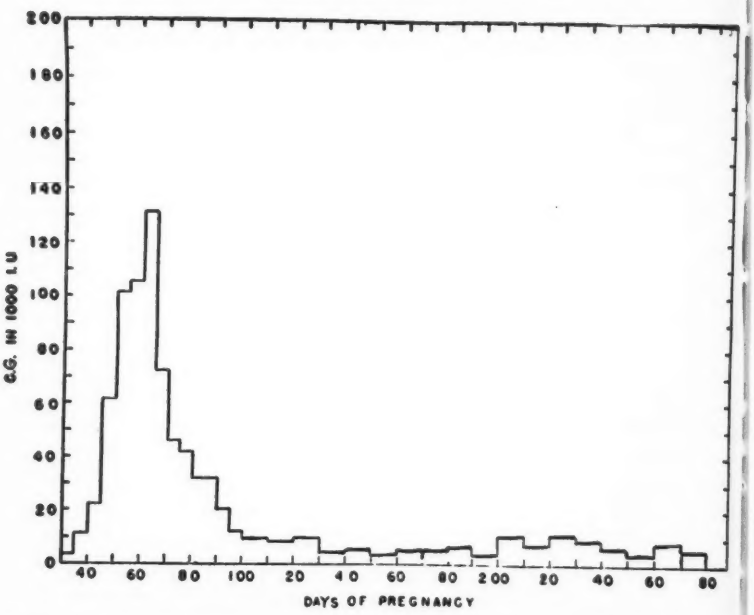

Figure 1. Average concentration of serum gonadotrophin at various times in normal pregnancy based on 24 cases. From Eastman, N. J.: Williams Obstetrics. *10th edition. Appleton-Century-Crofts, Inc., New York, N. Y., 1950. p. 160. (Adapted from Jones, G. E. S.; Delfs, E.; and Stran, H. M.: Chorionic gonadotropin and pregnanediol values in normal pregnancy.* Bull. Johns Hopkins Hosp. *75: 359-376, Dec. 1944.)*

better not to use the specimen; however, results can be obtained by doubling the concentration or the amount of concentrate injected into the frog. The frog is given 2.0 cc. of the concentrate. If the reaction is negative after one hour, 2.0 cc. of a known positive concentrate is injected. Results are reported as one half of the number of sperms observed per high-power field.

This laboratory has done about 1,500 of these tests and noted only six or seven discrepancies. One was a case of pseudocyesis,

which explained the repeated "false negative" tests obtained. In another case of obvious pregnancy, "false negative" tests were obtained in the latter part of the pregnancy. However, it is well-known[6] that the chorionic gonadotrophin hormone level falls sharply 120 or 130 days after conception and remains low for the remainder of the pregnancy (fig. 1), so that a large number of tests performed late in pregnancy give "false negative" results.[7-11]

The time required for the performance of this test is about 40 minutes for the concentration of the specimen, four minutes for each injection, and seven minutes for each microscopic examination. Results are usually obtained from 30 minutes to four hours.

SECOND ARMY AREA MEDICAL LABORATORY

The Second Army Area Medical Laboratory currently uses the *Xenopus laevis* test, or so-called Hogben test, modified by the use of serum with the technic developed at this laboratory by one of us (G. W. P.).[12] The Rosenfeld[13] method was tried originally but found to be time consuming. Aschheim-Zondek, which is performed primarily for quantitative hormone assay studies, and Friedman tests are resorted to when there is a shortage of clawed frogs.

Two cubic centimeters of clear serum, collected under sterile conditions, are injected into the dorsal lymph sac of the female clawed frog and repeated two hours later. The frog is then placed in distilled water in a standard incubator and examined 18, 24, and 48 hours later. Results at this laboratory[12] indicate that temperature and pH of the water are critical factors which markedly affect the sensitivity to the test.

About 99 percent of the positive results are observed in from six to 18 hours. The other one percent are delayed positive results appearing up to 48 hours later. The production of eggs is an end point which requires no special training or equipment to detect. These eggs are fairly large in size, varying from 3 to 5 mm. in diameter. The production of a single egg is considered a positive test. Congestion and hyperemia of the cloaca are suspicious signs. In such a case a second frog is injected after 24 hours, if enough serum is available; otherwise, the test is reported as inconclusive and a second specimen requested.

Those frogs giving a positive test are rested from 16 to 18 days. Because some frogs continue to produce eggs for several days, it is necessary to keep them a period of time in the distilled water and incubator. Frogs showing negative tests are used after one week, but if necessary, they can be used again after 48 hours. A master chart is maintained to indicate which

frogs are ready for use. In addition, an individual record is kept on each animal giving its complete history from the time it was received in the laboratory, and indicating its number, weight, the date of each test performed on it, and its result.

The time required for the performance of this test is about five minutes for each injection plus the short time for each examination. Results are usually reported in from 24 to 48 hours.

THIRD ARMY AREA MEDICAL LABORATORY

The Third Army Area Medical Laboratory performs the male frog (*Rana pipiens*) test, similar to that already described, with the following modifications: During the concentration procedure the hormone is separated from the koalin by addition of 1.5 cc. of 0.1 normal NaOH. If no spermatozoa are found after three hours, the frog is injected with a known positive concentrate to ascertain its ability to react. If no spermatozoa are found one hour after injection of the known positive, another frog is used.

The frogs are kept in a refrigerator at 10° C. in standard animal jars in one inch of distilled water to which 20,000 units of penicillin are added. Not more than 10 frogs are placed in a jar. The animals are removed from the jars, placed in glass screw-top containers, and kept at room temperature for an hour prior to injection. All frogs are examined for sex and the presence of spermatozoa when received and prior to use. This laboratory has noted that the sperm count decreases during the summer months.

FOURTH ARMY AREA MEDICAL LABORATORY

Two types of pregnancy tests are performed at the Fourth Army Area Medical Laboratory. The Aschheim-Zondek test is used for all routine specimens, and the Friedman test for rapid testing. The procedure used for the Friedman test is the same as that described by Kolmer and Boerner,[14] except that 20.0 cc. of urine are injected subcutaneously instead of 10 cc. intravenously. This modification reported by Ducey[15] gives results that are as reliable as those obtained by the standard method and has the advantage of simplicity and of avoiding toxicity in animals.

The procedure used for the Aschheim-Zondek test is the same as described by Simmons and Gentzkow,[16] except that only three mice are used for each test and four injections of urine are given subcutaneously in 48 hours. Each mouse receives 0.5 cc. of urine per injection, for a total of 2.0 cc.

No difficulty has been encountered with either test other than that the urine is occasionally still toxic for mice after detoxification.

FIFTH ARMY AREA MEDICAL LABORATORY

The Fifth Army Area Medical Laboratory routinely uses the *Xenopus laevis* test with the serum technic of Rosenfeld and reports that the simplicity, accuracy, speed, and generally satisfactory results of the test, coupled with the comparatively low cost, favors its retention.

Aschheim-Zondek and Friedman tests are reserved for quantitative determinations and as alternate tests in the event of shortage of clawed frogs.

SIXTH ARMY AREA MEDICAL LABORATORY

The Sixth Army Area Medical Laboratory has abandoned the *Xenopus laevis* in favor of the male frog test for pregnancy because it is more economical and requires less time. Mice are used for quantitative tests, but *Rana pipiens* are being investigated for this purpose.

DISCUSSION

In an army area laboratory the biologic tests for pregnancy are not usually of emergency nature whereas in a hospital the results are often desired within a few hours. Specimens are usually from two to four days in the mail, in transit to most area laboratories. When necessary, air transportation is available but there is still a delay of several hours before the specimen reaches the laboratory. Obviously, the surgeon who has a young woman under observation with an acute abdominal condition cannot wait several days for a laboratory report. Thus the necessity for a rapid method of pregnancy testing does not involve an army area laboratory.

Because speed is not of paramount importance, the ideal test for an area laboratory is the one most economical, simplest in technic, and requiring a minimum of the technician's time. It is our opinion that the *Xenopus laevis* test using serum meets these requirements best. It has a number of advantages over the male frog test:

1. Because most specimens are sent by mail, a saving in shipping space and expense occurs. The use of serum requires a 5 cc. specimen, compared to the 100 cc. for the male frog method. The latter method also involves the additional expense of returning the empty containers, a step involving two man-hours a week.

2. The use of serum provides a sterile specimen which decreases the chance of the frog's death, because voided urine is not sterile. There are also reasons to suspect that bacterial

contamination may be one of the causes for loss of hormone in urine specimens.

3. The toxicity problems associated with the use of urine are avoided by using serum.

4. The use of serum provides personal identification of the patient by the physician submitting the specimen. This advantage may be of medicolegal importance when it is imperative to maintain an unbroken chain of evidence.

5. The technic of the *Xenopus laevis* test with serum is simple so that a skilled technician is not required.

6. The time consumed in the performance of this test is far less than that required by the male frog method.

7. Only six percent of the circulating hormone is excreted in the urine, whereas 94 percent is endogenously destroyed.[17] The ratio of the concentration of hormone per cc. in serum and urine at any time during pregnancy is about 3.3:1.0.

8. Although the problem of seasonal variation in the response of the *Rana pipiens* to gonadotrophins has not been definitely elucidated, no such problem is experienced with the *Xenopus laevis*.

9. Experimental evidence[18-20] indicates that the *Xenopus laevis* is the only animal currently used for pregnancy testing that does not react to the follicle-stimulating portion of the pituitary or the naturally occurring ovarian hormones. Accordingly this test never gives "false positive" results.

10. Although the initial cost of a *Xenopus laevis* seems large, when the expense per test is calculated considering the number of tests possible per frog, then the cost per test using the *Xenopus laevis* is actually less than the test using the male frog. The cost of each *Rana pipiens* is about 50 cents. If only one frog is used, the cost would be 50 cents per test but when two frogs are used for each test, the cost would be about 75 cents per test. This is based on the assumption that half of the tests are negative, in which case one of the frogs is given an injection of a known positive specimen and only those giving a positive reaction are discarded.

In the experience of the Second Army Area Medical Laboratory with the *Xenopus laevis*, each frog can be used for an average of six or seven tests during its lifetime of about six months. The expense of keeping the animals is small. The cost of each frog is about four dollars. Therefore, the cost per test with the *Xenopus laevis*, considering unexplained deaths of animals as well as preventable laboratory accidents other than epizootics, would be about 62 cents.

It is obvious that the test using the *Xenopus laevis* is more economical when the cost is computed on the number of tests that can be performed on each animal. Other advantages of the *Xenopus laevis* test over the male frog test include a saving of glassware and chemical reagents; and in addition, fewer microscopic examinations are required and the demands on the technician's time and skill in completing the test are appreciably reduced.

The accuracy of the *Xenopus laevis* test, employing serum, compares favorably with all other procedures. At the Second Army Area Medical Laboratory, the test was 99.2 percent accurate on the basis of clinical follow-up in 122 cases. However, the patient must not be less than 21 days, nor more than 67 days, past her expected menses (fig. 1), and the serum must be sterile and free of hemolysis, or the results of a test using the *Xenopus laevis* will be unsatisfactory.

In a series of 122 determinations, eight tests were in disagreement with the clinical findings. Four of these specimens were submitted too early in the pregnancy (three patients were only 11 days past their expected menses and one was 17 days past). Three specimens were submitted too late (two patients were 69 days and one was 86 days overdue). The eighth specimen was from a patient with a threatened abortion; the test was negative on her admission to the hospital, but was positive a week later. In 45 patients, in whom pregnancy was subsequently proved by clinical findings, the test gave positive results.

SUMMARY

The present status of the biologic tests for pregnancy in army area laboratories has been reviewed. The merits of the male frog (*Rana pipiens*) test with urine and *Xenopus laevis* (Hogben) test employing serum were compared, and the economy, simplicity of technic, accuracy, and speed of performance favors the *Xenopus laevis* test with serum as the ideal method for use by an army area laboratory.

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Contributions of Paul Ehrlich

Most great men in medicine are remembered because their names are connected with one fundamental discovery, with the description of one or several diseases, with important symptoms or signs, or with technical or operative procedures. Paul Ehrlich's contributions to medicine are so numerous that it is not possible to link his name with one particular achievement. In hematology, in immunology, and in chemotherapy (a means of treatment which he originated), Ehrlich established many basic facts, developed a number of fundamental methods, and coined a multitude of terms that have become the common property of the medical profession. They are used so frequently that the name of Paul Ehrlich now is seldom quoted in this connection.

—HANS C. S. ARON, M. D.

in *Journal of the American Medical Association,*

p. 969, Mar. 20, 1954

THE USE OF FLAME PHOTOMETRY IN THE CLINICAL LABORATORY

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KENNETH F. ERNST, *Colonel, MC, USA*

SINCE the advent of commercial flame photometers in 1945, the routine determination of sodium, potassium,[1-10] and, more recently, calcium[1,10-17] in blood serum and urine by this instrument has become very useful. This quantitative analytic technic is rapidly replacing the time-consuming gravimetric and titrimetric methods. Many more analyses can be done without additional laboratory technicians and more pathologic electrolyte abnormalities can be found, because sodium, potassium, and calcium determinations by flame photometry require less than 30 minutes. The rapid determination of electrolytes in patients with anorexia, diarrhea, vomiting, tetany, acidosis, and renal abnormalities are extremely helpful to their treatment.

During 1953 at this hospital, complete electrolyte studies were made on blood serum, urine, and bath fluids of five patients who had been treated with the artificial kidney, and the results were available within a few minutes after the specimens were obtained. These quantitative studies are the only known methods for obtaining and following the exact electrolyte status of these patients. Unknown at the time the patients were admitted, 20 routine blood specimens were revealed to be low, or dangerously high, in potassium content; 15 were low in calcium, and five in sodium.

THEORY AND ACCURACY

The principal steps in flame photometry are the atomization of the diluted sample of serum or urine into the flame, isolation of the characteristic spectral emission of the element desired, and detection and measurement of this emission.

Flame photometers for use in the clinical laboratory are now available at moderate prices. Some instruments are more versatile than others because basically they are spectrophotometers and can be used for other chemical measurements such as absorbency, fluorescence, or turbidity. The addition of such an attachment is

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not expensive in those laboratories already employing a spectrophotometer for which flame attachments are available. Only a few feet of bench space for a flame photometer are required, and a small area for gas tanks and air compressor if these are needed. A special room is ideal but not necessary for the apparatus. Contaminants present in the air can virtually be eliminated by an air cleaner and precipitator[18] which is easily attached. Closed burner systems are now available on most instruments. Bottled

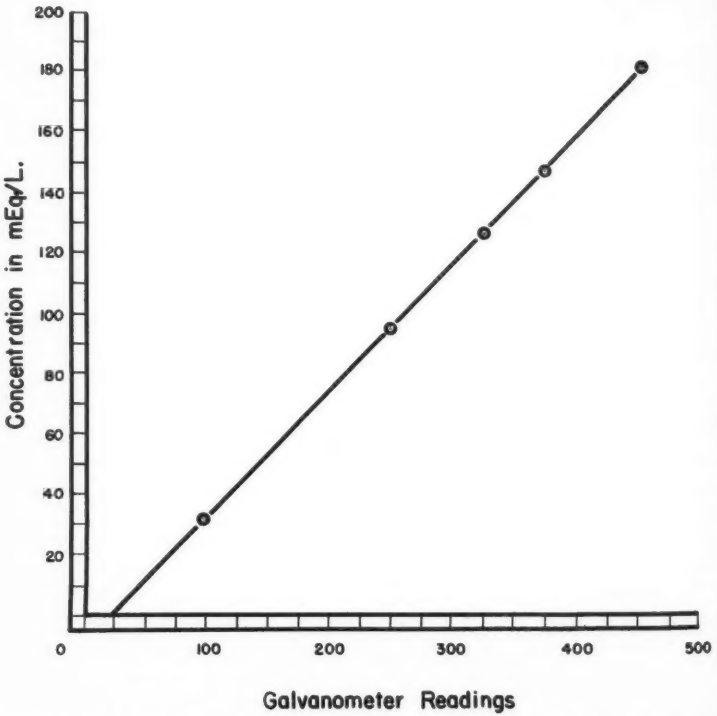

Figure 1. Calibration curve for sodium in blood serum and in urine at dilution 1/100 using the "internal standard" solution of 1,000 p. p. m. lithium sulfate (5 ml. per 50 ml. solution). Standard stock solution contains 142 mEq./L. of sodium as sodium chloride.

or city gas and a source of compressed air can be used for the emission of the sodium and potassium atomic spectral lines. For the more difficult emissible calcium line, fuel gas (hydrogen or acetylene) and oxygen are required.

The flame photometer with a chamber into which the sample is sprayed before it passes to the burner and the type in which the

sample is sprayed directly into the flame without a separate chamber are satisfactory for routine clinical work. The measuring system of the flame photometer is composed of one or more photodetectors with or without an electronic amplifier, and a null or direct-reading galvanometer. Barrier layer cells and photomultiplier tubes are now available to increase the sensitivity of the detectable light emitted from an element. Interference filters are available for some instruments. The photomultiplier tube has

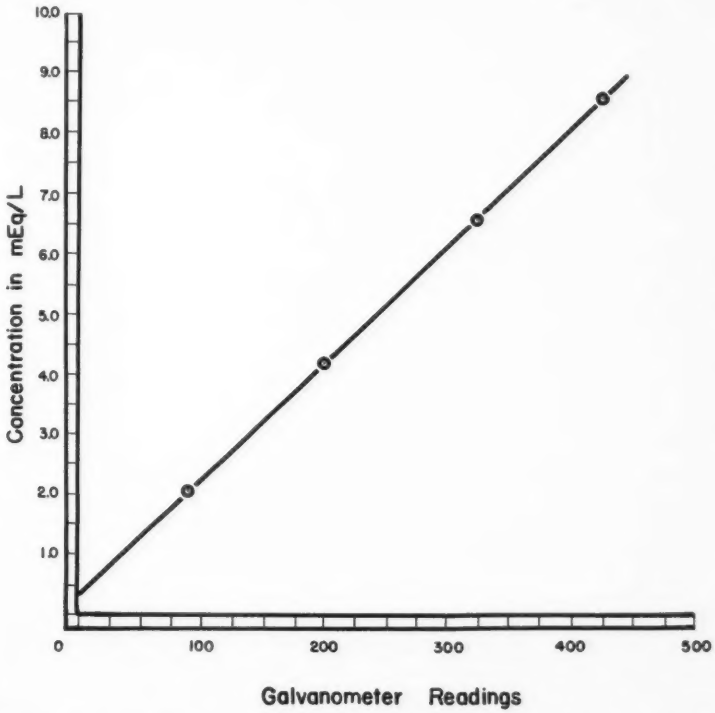

Figure 2. Calibration curve for potassium in blood serum and in urine at dilution of 1/100 blood serum and 1/500 urine using the internal standard solution as for sodium. Standard stock solution contains 5.0 mEq/L. of potassium as potassium chloride.

made the quantitative determination of calcium possible on 0.1 ml. of untreated samples of blood serum and urine.[14, 16, 17] The routine determination of magnesium[6] has not yet been standardized because the results on ashed samples have not been uniformly satisfactory.[19]

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All samples must be in solution and the flame emission compared with that of standard solutions of the element to be determined. Figures 1 through 4 are examples of calibration standard curves obtained in this laboratory. The sodium and potassium curves were obtained on the Barclay instrument by using an internal standard[20] of lithium sulfate. The calcium curves were obtained on the Beckman DU instrument with flame and photomultiplier attachments. Standard calibration curves must be

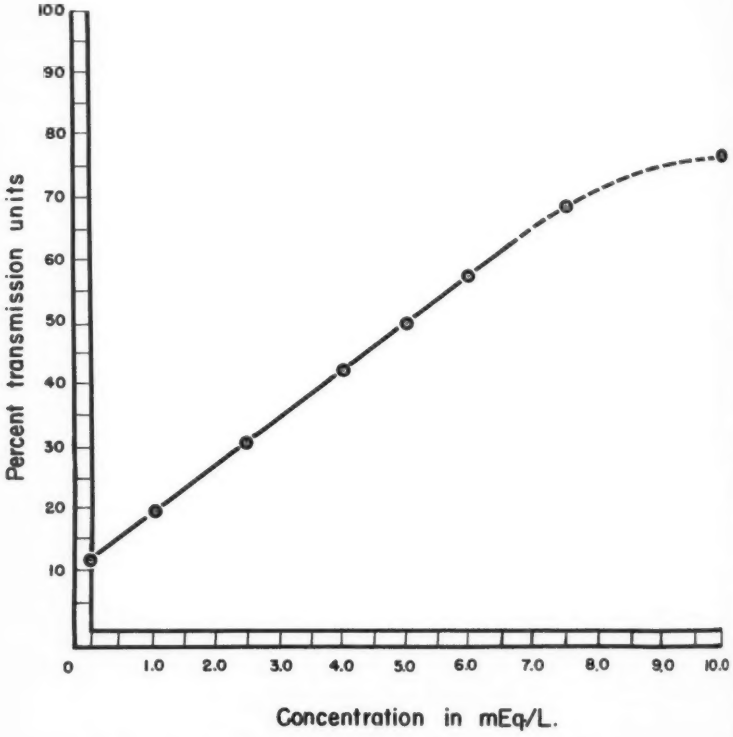

Figure 3. Calibration curve for calcium in blood serum.

plotted daily. In the calibration curve for calcium in serum at dilution 1/50 (diluent glacial acetic acid, acetone, and sterox, which is essentially the organic solvent described by G. R. Kingsley and R. R. Schaffert at the 123d National Meeting of the American Chemical Society, Los Angeles, Calif., March 1953), the standard stock solution contains 142 mEq./L. of sodium as sodium chloride, 5.0 mEq./L. of potassium as potassium chloride, 2.0 mEq./L. of magnesium as the metal, 4.7 mEq./L. of phos-

phorous as $(NH_4)_2HPO_4$, and 5.0 mEq./L. of calcium as calcium carbonate. The standard solution alone without calcium reads 14 percent transmission units. The organic solvent alone reads 13 percent transmission units (fig. 3). In the calibration curve for calcium in urine at dilution 1/50 (diluent same as for blood serum) the standard stock solution contains 133 mEq./L. of sodium as sodium chloride, 42 mEq./L. of potassium as potassium chloride, 8.3 mEq./L. of magnesium as the metal, 48.2 mEq./L.

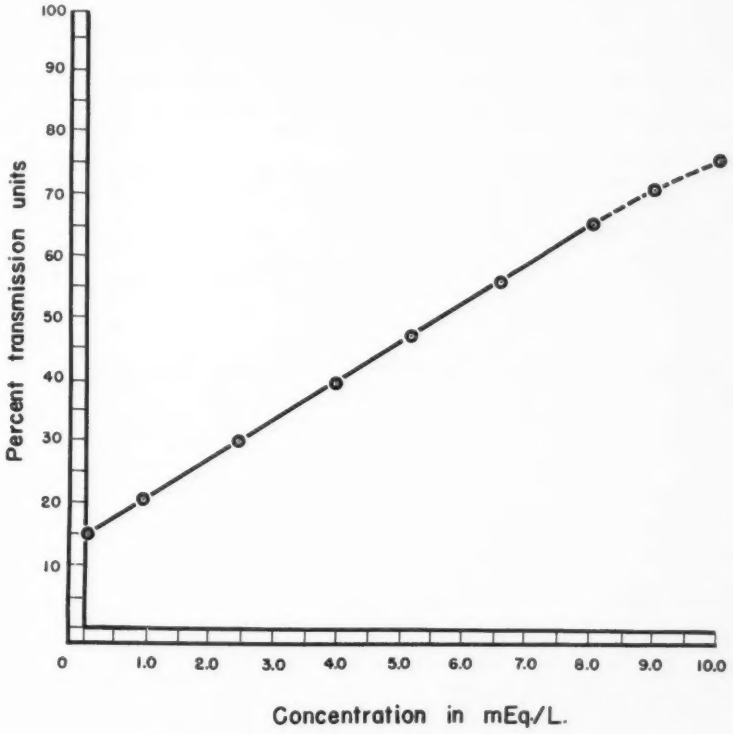

Figure 4. Calibration curve for calcium in urine.

of phosphorous as $(NH_4)_2HPO_4$, and 5.0 mEq./L. of calcium as calcium carbonate. The standard solution alone without calcium reads 13 percent transmission units. The organic solvent alone reads 12 percent transmission units (fig. 4).

Results are dependent on the accuracy of the standard solutions and the cleanliness of the glassware. Most instruments can yield analytic results with an average error of less than five percent of the amount present.[3,16] The average error in deter-

mination of urine calcium is about 10 percent of the amount present.[13,16,17] This error is presumably due to the urinary phosphates which depress the calcium emission. The internal standard, when used, corrects instrumental fluctuations to some extent and helps the effect of various constituents on the drop-size distribution and fraction of spray reaching the flame (in instruments employing a spray chamber). The internal standard does not curb radiation interference which is the most troublesome factor in the flame. The flame emits light continously throughout the spectral range (flame background) so that the ratio of light emitted by an element to the background light of the flame is of considerable significance.

TABLE 1. *Values of sodium, potassium, and calcium in blood serum and urine of normal persons obtained by various investigators using flame photometry*

Investigators and reference numbers	Year reported	Number of tests	Determination	Specimen tested	Range mEq./L.	Mean mEq./L.
Cholak and Hubbard[2]	1944	Not given	Na	Urine	Not given	170
			K	Urine		56.4
			Ca	Urine		1.75
Elliott and Holley[3]	1951	400	Na	Serum	135-155	144.7
			K	Serum	3.1-5.5	4.18
Hald[5]	1947	Not given	Na	Serum	130-145	
			K	Serum	4.2-4.9	
Marinis and associates[7]	1947	107	Na	Serum	135.5-153.2	144.0
			K	Serum	3.6-6.2	4.52
Overman and Davis[9]	1947	30	Na	Serum	140-159	153
			K	Serum	3.6-7.2	5.1
			Na	Urine	35-167	96
			K	Urine	2.7-19	5.
Smith and associates[10]	1950	70	Na	Serum	136-158	142
		73	K	Serum	3.61-4.85	4.06
Riethmüller[13]	1953	300	Ca	Serum	Not given	
		100	Ca	Urine		
Winer and Ernst[16]	1953	100	Ca	Urine	3.0-10.0	5.
Winer and Kuhns[17]	1953	200	Ca	Serum	4.2-5.1	4.8

NORMAL VALUES

The values of sodium, potassium, and calcium in the blood serum and urine of normal persons obtained by various investigators by flame photometry are summarized in table 1. The distribution curves for these electrolytes compare well with hypothetic normal curves.[3,13,16] Comparisons with chemical methods indicate that sodium values are the same within the limits of experimental error by both methods. Lower potassium values, however, are obtained by flame photometric methods than by chemical analysis.[3] In Riethmüller's[13] recent series of 300 serum calcium determinations, all were normal by chemical analysis, but 12.7 percent were out of the normal range by flame photometry analysis (6.7 percent below and 6.0 percent above). A similar series of 100 urine calcium determinations showed a standard deviation of 31 percent as compared with the chemical acidimetric titration method. The author, however, presents no data to verify this high deviation and normal values are not included. These results conflict with other experimental evidence reported in this country.[16,17] Additional investigation on the interference of phosphates on urinary calcium determinations by flame photometry apparently is necessary.

SUMMARY

Flame photometry is becoming very useful in the clinical laboratory. The determination of sodium, potassium, and calcium on as little as 0.5 ml. of blood serum or urine can now be done on commercial flame photometers by the average laboratory technician with an accuracy applicable to routine clinical work.

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Three Groups of Obstetricians

Broadly speaking, one may classify obstetricians into three groups according to attitude. Those in the first group, rooted in the days when most deliveries took place at home, are inclined to give time and attention beyond the patient's actual medical and surgical needs, and to use individualized amounts of analgesia and anesthesia. Those in the second group delegate to their assistants many of the routine procedures without psychologic integration of reactions of either the patients or the delegates, plus the use of notable amounts of analgesia and anesthesia during labor and delivery. This tends toward full amnesia for many hours, including prolonged anesthesia for delivery. Obstetricians in the third group devote calculated attention to a woman's psychologic needs, educating her and enlisting her interest and active participation in her pregnancy and labor. Analgesia and anesthesia are used moderately and intelligently according to the individual needs and desires of the patient, and calculated attention and moral support are forthcoming when they are needed.

—HAROLD B. DAVIDSON, M.D.
in *Journal of the International College of Surgeons*,
p. 106, Jan. 1954

PSEUDOEPITHELIOMATOUS HYPERPLASIA ASSOCIATED WITH MYOBLASTOMA

A Diagnostic Pitfall

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LORENZO R. BERRY, *Major, MC, USA*
A. L. EDWARDS, *First Lieutenant, MC, USA*

THE epithelial or epidermal hyperplasia commonly overlying a myoblastoma may be mistaken for squamous cell carcinoma.[1-5] Our attention was directed to this unfortunate diagnostic error because of seven specimens of myoblastomas received by this laboratory in the past few months, two had been diagnosed as squamous cell carcinomas.

CASE REPORTS

Case 1. A 38-year-old woman had a slowly enlarging posterior cricoid lesion that had been present for about six weeks. A biopsy was done and histologically the lesion had been interpreted as being squamous cell carcinoma. On examination at this laboratory, the biopsied specimen showed thick epithelium with irregular downgrowths into the underlying nodular mass of cells. Within some of these epithelial downgrowths were keratinized pearls. The subepithelial cellular infiltrate extended up to the epithelium and in some fields surrounded the irregular epithelial downward extensions. These subepithelial cells were predominantly large polyhedral cells with coarsely granular eosinophilic cytoplasm. The nuclei were round, vesicular, and some contained a single nucleolus. The nuclei of the cells in most fields were eccentric, in many fields no nuclei were discernible, and in occasional fields the cells contained multiple nuclei, usually two. In addition, an occasional field contained cells with syncytial cytoplasmic masses and multiple nuclei. This lesion was interpreted as representing a myoblastoma of the larynx, with overlying squamous hyperplasia (fig. 1).

Case 2. A 23-year-old man complained of a tender indurated mass, 1.5 cm. in diameter, of the buttocks, which interfered with

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sitting. The patient related the lesion, which was excised, to a scorpion bite. After histologic examination the diagnosis of squamous cell carcinoma had been considered. On examination at this laboratory, however, the specimen showed a thickened

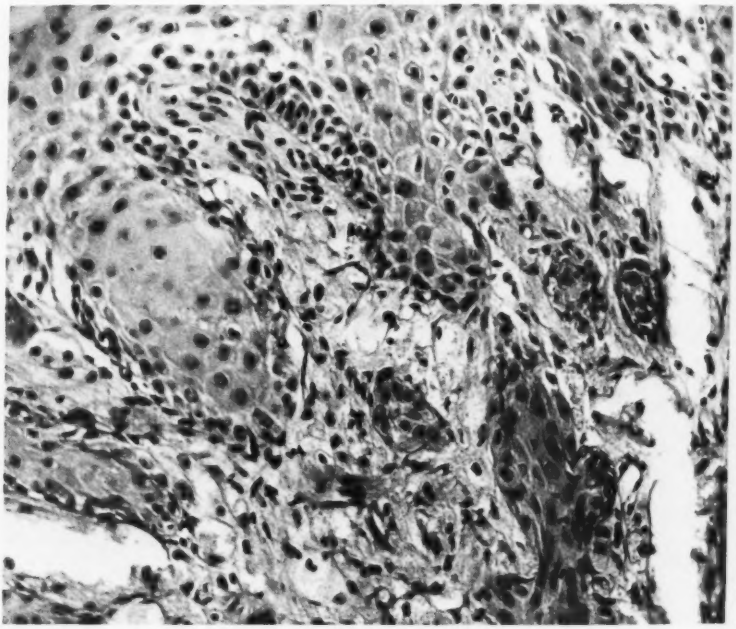

Figure 1 (case 1). Section of epithelial hyperplasia showing the underlying myoblastoma. (× 450)

epidermis covering a dense cellular dermal infiltrate which consisted of small and larger polyhedral cells, similar to those in case 1. The epidermis extended down irregularly into the cellular infiltrate and in places formed keratin pearls (fig. 2).

DISCUSSION

The diagnosis of squamous cell carcinoma in these two lesions was erroneously made because of the striking and prominent overlying epithelial and epidermal hyperplasia. The features differentiating the overlying hyperplasia from squamous cell carcinoma are the intactness of the basement membranes about the epithelial downgrowth, the well differentiated squamous cells with few atypical cells, relatively few mitoses, little dyskeratosis and the absence of features usually seen in carcinoma, such as hyperchromasia and individual cell keratinization. The

differentiation may at times be difficult and it is helpful to be aware of the underlying myoblastoma.

Figure 2 (case 2). Epithelial hyperplasia and the underlying myoblastoma. (× 100)

The "myoblastoma" cells also vaguely resemble xanthomas because of the resemblance of the plump polygonal "myoblast" cells to xanthoma cells.[2,6] Myoblastoma cells, however, do not stain with ordinary fat stains.

SUMMARY

Myoblastomas may be mistakenly diagnosed histologically as squamous cell carcinomas. This error is made primarily because of the prominent overlying epithelial or epidermal hyperplasia and, to a lesser extent, the vague resemblance of the so called "myoblastoma" cells to squamous epithelial cells. These cases are presented to re-emphasize this serious pitfall in diagnosis and so to prevent unnecessary extensive surgical procedures.

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Centennial of Paul Ehrlich

In 1905 the discovery of the microbe causing syphilis was announced. This event was of great importance in medicine. The Kitasato Institute for Infectious Diseases was founded in Tokyo, on his return to Japan, by Kitasato, a friend of Ehrlich's since the time of their studies at the laboratory of Robert Koch in Berlin. And now, after the discovery of the syphilis spirochete, one of the most talented of Professor Kitasato's pupils, Dr. Hata, started at once with experiments to produce syphilis in rabbits by inoculation, gaining great skill in his work. In the spring of 1909 Dr. Hata was sent to Ehrlich to continue work on these lines at the Speyer-Haus, producing infections in rabbits experimentally and then testing on these infected animals the curative properties of the preparations worked out by Ehrlich. Dr. Hata was delighted to do this work, took all the small bottles Ehrlich gave him, with inscriptions on the labels, and said proudly, with a nod, "418," "606." Dr. Hata, after his first trials of all the substances given to him, soon came to show Ehrlich his records, and said: "Believe 606 very efficacious." Ehrlich would not believe it, and Hata, untiring, did not shirk repeating the experiments again and again until a clear and definite result was obtained that 606 was best. Ehrlich then confessed that he always had had a strong feeling—yes, had been convinced for two years—that 606 must be good. Trial treatments of patients had now to be made again by those collaborators who had already been working with 418 successfully, and finally Ehrilch consented to announce the invention of 606 to the world, following a number of publications showing good results.

—MARTHA MARQUARDT, Secretary to
Paul Ehrlich, 1902-15
in *British Medical Journal*, p. 666,
Mar. 20, 1954

A NEW BURIED MOVABLE ORBITAL IMPLANT

JOHN H. KING, Jr., *Colonel, MC, USA*

THE advantages of placing an implant in the orbit following the removal of the eyeball have been well established. During the past decade many implants have been devised in an effort to impart greater motility to the prosthetic eye.

The exposed or partly buried movable implant, which communicates directly with the prosthesis, gives superior mobility to the artificial eye and results in an excellent cosmetic appearance. These implants however have not withstood the test of time. They are not advised for military use because they eventually all extrude spontaneously or must be removed because of chronic infection.

The buried or completely covered movable implant does not connect directly with the prosthesis, but transmits movement to the artificial eye by causing motility of the socket in which the prosthesis is placed. The motion is not as good as with the exposed type, but the socket rarely becomes infected and extrusion is unusual. This type is preferred for use in military patients following enucleation of an eye when the orbit is free of infection.

There are advantages and disadvantages in the use of various types of buried movable implants. Those which are partly covered by a wire mesh of tantalum or stainless steel are preferable, because they impart good motion and do not tend to migrate within the orbit.

Sixty-seven of the implants described in this report, a modification of that of Allen and Allen,[1] have been used during the past two years without the occurrence of rotation or extrusion. It is a muscle-tunnel type of methyl methacrylate with the anterior surface covered by stainless steel wire mesh (No. 316), 50 by 50 strands per square inch, of 0.003-inch thickness, held in place by a stainless steel wire ring 0.025 inch in diameter. Tantalum mesh and wire were originally used to cover the implant, but stainless steel is less apt to fragment. Two sizes

From Walter Reed Army Hospital, Washington, D. C.

were made. The larger, for adults, measures 18 mm. in diameter and 12 mm. in depth in the center with smooth rounded sides. The smaller size, for children and secondary implants, measures 15 mm. on the face and 12 mm. in depth. Four tunnels, equally spaced through the sides of the plastic, are brought together in the open-faced front under the wire mesh (fig. 1).

TECHNIC OF INSERTION

A circumcorneal incision is made through the conjunctiva by means of a blunt, curved canaliculus knife or small sharp-pointed scissors. Tenon's capsule is separated from the sclera as far

Figure 1. The muscle-tunnel type of orbital implant.

back as possible by blunt curved scissors, and the four rectus muscles are isolated in their sheaths well back 10 to 15 mm. Separate No. 0000 plain or mild chromic double-armed catgut sutures are secured in each muscle at its insertion. The muscles are then sectioned from the globe, and the sutures are clamped to the drapes maintaining their relative positions. The oblique muscles are cut and allowed to retract (fig. 2A).

The eyeball is freed of its attachments by enucleation scissors as far back as the optic nerve which is sectioned. Previously placed scleral traction sutures or a Well's spoon placed behind the globe will insure a long nerve stump when this is desired. Complete hemostasis is obtained by placing hot gauze packs in the socket and maintaining firm pressure. Each double-armed suture in a rectus muscle is then taken through a tunnel in the

implant and the needles are brought through the covering mesh as near the center as possible (fig. 2B). The sutures are tied over the mesh and the lateral and medial ones are cut. This fixes the implant and prevents rotation (fig. 2C).

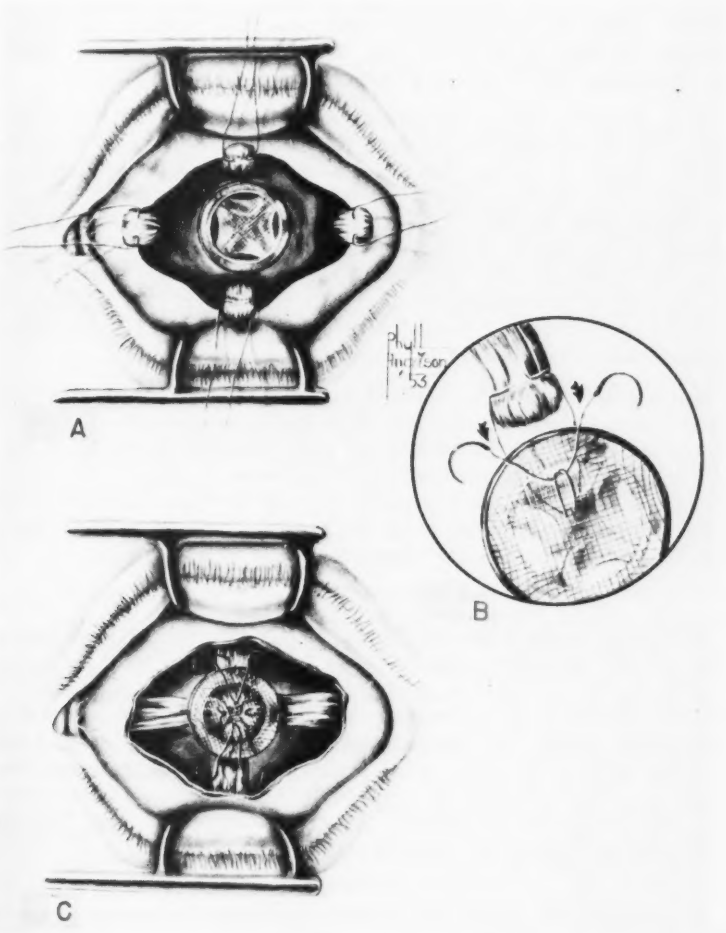

Figure 2. (A) *The orbit showing the four rectus muscles held in their relative position by sutures and the implant set in place.* (B) *The suture from a rectus muscle is passed through one of the tunnels and brought up through the mesh near the center of the implant.* (C) *The orbit showing the sutures tied separately over the mesh of the implant. Those from the medial and lateral rectus muscles have been cut.*

The implant is now pushed well back into the orbit. Tenon's capsule is separated from the conjunctiva for a distance from 6 to 8 mm. around the entire cut edge. The tied sutures which were left long from the superior and inferior rectus muscles are then taken through the upper and lower part of the freed Tenon's capsule about 5 mm. from the cut edges. A purse-string suture closes Tenon's capsule, and the muscle sutures previously brought through are tied and cut. The conjunctiva is then closed by interrupted No. 0000 plain catgut sutures.

As a variation, Tenon's capsule may be closed by the overlapping method as follows: A double-armed No. 0000 mild chromic catgut suture is passed through the center of the lower flap from without, several millimeters from its edge, and is carried through the upper flap, penetrating 6 to 8 mm. above the free edge from within. A suture is similarly passed on each side of the first, and the three sutures are tied and cut. The free edge of the superior flap is sutured securely to the lower part of Tenon's capsule by interrupted catgut sutures. The conjunctiva is closed as previously described.

Antiseptic ointment is applied to the socket and a plastic conformer is inserted. An eye pad is placed over the lids which may be closed by a central suture. A firm pressure dressing is applied and is not removed until the fifth postoperative day. A custom-made or a standard artificial eye may be fitted from 18 to 21 days later when the socket is well healed. Motion is excellent within the "conversational" cosmetic range of about 20°.

SUMMARY

Buried movable orbital implants, partly covered by wire mesh, are safe for use in military patients following enucleation. Sixty-seven plastic implants constructed with four muscle tunnels and an oval flat-front face covered with stainless steel mesh in which the rectus muscles are sewed to the back of the mesh where the tunnels meet have been used following enucleation during the past two years. Motion transmitted from the socket to the artificial eye is excellent within the conversational range, and no rotations or extrusions of the implants have occurred.

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TREATMENT OF INFLUENZA WITH ERYTHROMYCIN

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GORDON A. MEIKLEJOHN, M. D.

THIS report concerns the use of erythromycin in the treatment of type A-prime influenza. This antibiotic appears to be similar in antimicrobial range to penicillin.[1] Although no reports have appeared to indicate effectiveness against influenza virus, it has been reported to show activity against some of the larger viruses.[2] In order to obtain direct evidence in humans of its possible effectiveness in influenza, a controlled study was conducted during an epidemic at a U. S. Air Force base during the winter of 1952 and 1953.

MATERIAL

The patients in this study were previously healthy young men assigned for military training. The influenza epidemic began abruptly during the first week of January 1953, three days after most of the airmen in this study had returned from a holiday furlough. The epidemic reached its peak within nine days, then rapidly subsided during the following week.

During the three months preceding the epidemic an average of 203.7 patients were admitted to the hospital each month because of acute respiratory diseases. In January 1953, 817 patients were admitted to the respiratory disease service. Of these, 578 (70.7 percent) were clinically diagnosed as having influenza. In the three months following the subsidence of the epidemic the monthly admission rate for respiratory disease decreased to an average of 242.3 patients per month (fig. 1).

It is of interest to note the marked increase in the number of dispensary visits during the epidemic period. For the five-week period immediately preceding the epidemic an average of 1,096.6 persons visited the dispensary each week. During the two-week influenza period, visits averaged 2,330.5 weekly. In the five subsequent weeks the average number of visits decreased to 1,304.8 weekly.

METHOD

The diagnosis of influenza in the patients in this study was made on the basis of clinical and laboratory findings. The typical

From U. S. Air Force Hospital, Lowry Air Force Base, Denver, Colo.

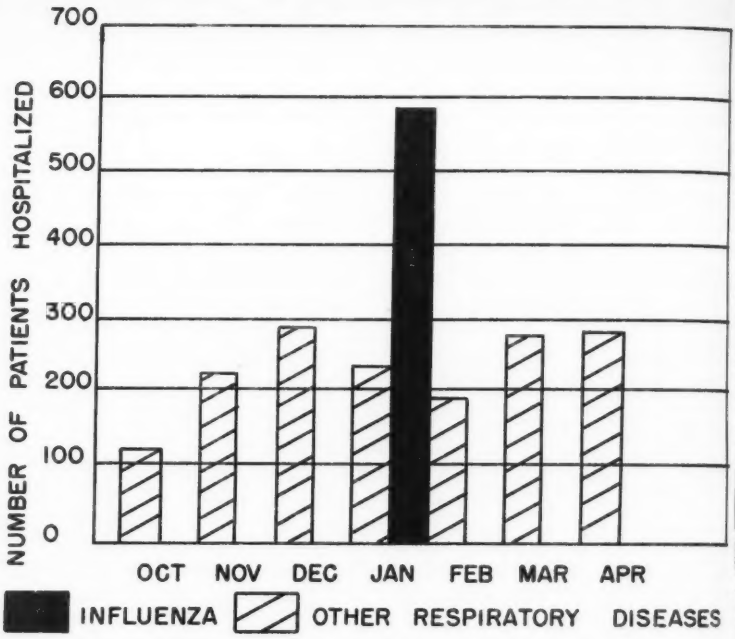

Figure 1. Incidence of influenza and other respiratory diseases.

patient complained of sudden onset of chilly sensations, fever, headache (usually generalized but occasionally retro-orbital), low backache, generalized muscular aching, and a nonproductive cough. Positive physical findings usually were fever ranging from 99° to 104° F., mild conjunctival injection, mild pharyngeal injection, and scattered coarse rales at the lung bases.

Acute phase serum was obtained from 108 Air Force personnel hospitalized with a diagnosis of influenza. Convalescent serum was subsequently obtained from 98 of these patients. Ninety-five of these showed a significant increase (fourfold or greater) in the complement-fixing antibodies in tests with influenza type A-prime antigens (Be 1-48). Because of irregularities in treatment schedules, nine of these were excluded from the study, leaving 86 patients.

The patients were divided into two groups on the basis of the last digit in their serial numbers. Forty-six were treated with erythromycin and 40 with penicillin. One group received erythromycin, 400 mg. every eight hours for a total daily dose of 1.2 grams. The other group received procaine penicillin, 300,000 units every 12 hours. Treatment was continued for three or four days.

Penicillin was used as a control preparation for two reasons: Streptococcal infections were prevalent in resident population of the base at this time, and Thalmann and associates[3] had previously shown, in a well-controlled study, that penicillin had no effect on the course of influenza.

TABLE 1. *Comparison of results in both groups*

	Mean duration of fever (hours)		
	Prior to treatment	After treatment began	Total duration
Penicillin-treated group 40 patients	27.7	47.5	74.2
Erythromycin-treated group 46 patients	28.1	46.5	74.4

Results are summarized in table 1. The mean duration of fever prior to treatment in the erythromycin-treated group was 28.1 hours

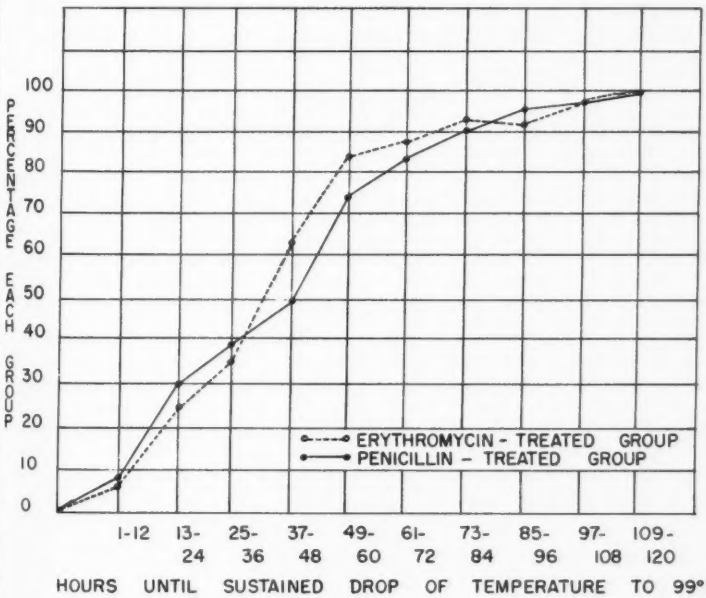

Figure 2. Comparison of time required for temperature to fall to 99° F. in erythromycin- and penicillin-treated groups.

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and in the penicillin-treated group 27.7 hours. After the institution of treatment the mean duration of fever, prior to a sustained drop in temperature to 99° F. or lower, was 46.5 hours in the erythromycin-treated group and 47.5 hours in the penicillin-treated group. The mean total duration of fever in the erythromycin-treated group was 74.4 hours and in the penicillin-treated group 74.2 hours. The percentage of each group reaching a sustained drop in temperature to 99° F. or lower at any given time during the study is shown in figure 2. This demonstrates no significant difference in the erythromycin-treated group and in the penicillin-treated group. In both groups the temperature of over 75 percent of the patients returned to normal within 48 hours.

CONCLUSIONS

The results of a controlled study of type A-prime influenza show no difference in duration of illness between a group of 46 patients treated with erythromycin and a group of 40 patients who received procaine penicillin. The course of illness in the patients did not appear to be influenced by erythromycin. The drug was well-tolerated by all patients receiving it. Mild gastrointestinal symptoms of anorexia and minimal diarrhea occurred in a few persons, but were not severe enough to necessitate withdrawal of the drug. There were no manifest bacterial complications in either the erythromycin-treated or the penicillin-treated groups.

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The True Physician

No physician can afford to be without extensive scientific knowledge and skill, but many physicians who lay their wreaths on the pedestal of pure science are surprised to find, sooner or later, that their idol is a false one. The patient comes to his physician to be comforted, and the scientific treatment of disease is but one phase of that comfort. The true physician will ease his patient's pain, give sympathetic understanding to his emotional turmoil, and classify and treat his disease with as simple and direct means as may exist.

—From an editorial in *New England Journal of Medicine*, p. 73, July 10, 1952

THE INCIDENCE OF ANTIBIOTIC-RESISTANT STAPHYLOCOCCI IN NONGONOCOCCAL URETHRITIS

WILLIAM M. GROTON, *Lieutenant (MC) USNR*

IN recent years increasing numbers of staphylococci have become resistant to antibiotics.[1,2] Seventy-five percent of staphylococci from low-grade skin infections are resistant to penicillin, and 25 percent to aureomycin.[3,4] Wilson and Cockcroft[5] reported a high incidence of similarly resistant staphylococci to be present in the nasopharynges of healthy persons working with hospital or clinic patients. In the population as a whole, the nasopharyngeal carrier rate is low. Whatever the mechanism is by which resistance develops, it is generally agreed that it develops with exposure of the bacteria to the antibiotics.

Nongonococcal urethritis, which constitutes a major problem to the armed services, is a low-grade infection of the male urethra and prostate gland occurring in young men who are sexually active and have usually taken penicillin orally for the prevention of gonorrhea.[6] Treatment of this disease with penicillin is unsatisfactory, but aureomycin has been found to be effective. The staphylococcus is the organism most frequently found on culture of the urethral exudate.[7,8,9] Because of the extensive but ineffective treatment of these patients with penicillin, one would expect the staphylococci found to be resistant to the drug. To find out if this is true, every patient coming to sick bay with a purulent urethral discharge not due to gonorrhea was studied bacteriologically. This study was done aboard four destroyers operating in the Far East during the four-month period between September and December of 1953.

METHOD

Smears of the urethral exudate were stained by Gram's method. Cultures were obtained from the urethra in the following manner: The meatus and glans were cleaned with 70 percent alcohol, the anterior urethra was stripped down to express a discharge, and a drop or loopful of the expressed material was placed on a plain

From U. S. Navy Destroyer Division 302. Dr. Groton is now at 8 Elm Street, Westerly, R. I.

nutrient agar slant and incubated. When no urethral material could be obtained, the prostate was massaged and the second or third drop of the purulent material obtained was used for culture. If less than three or four colonies grew and no organisms were seen on smear, the result was considered negative.

No cultures were done for gonococci. Gonorrhea was presumed to be ruled out in each case by the clinical picture and by a negative smear for gram-negative intracellular diplococci.

All staphylococci found by culture were tested by the filter-paper disk method for sensitivity to penicillin and to aureomycin.

RESULTS

Table 1 summarizes the pretreatment data on the 55 patients studied. On clinical grounds, patients were considered to have an "acute" or a "chronic" condition, depending on the duration of the symptoms. Those in the acute group were classified as "nongonococcal urethritis" patients in the health record, and were by far the more frequent of the two. These patients gave a history of a urethral discharge of but one or two days' duration, no past history of the disease, and a fairly clear-cut history of sexual exposure, usually two weeks before the onset of symptoms. Every patient had used penicillin orally as a prophylaxis. The chronic group, composed of "chronic prostatitis" patients, complained of intermittent and more varied symptoms, often without any demonstrable urethral discharge. These patients usually had a history of previous treatment for nongonococcal urethritis within the past two or three months.

TABLE 1. *Results of cultures and sensitivity determinations before treatment*

Infection	Number of cases	Positive for staphylococci	Staphylococci resistant to penicillin	Staphylococci resistant to aureomycin
Acute	27	15 (56%)	12 (80%)	3 (20%)
Chronic	28	9 (32%)	7 (78%)	4 (44%)
Total	55	24 (44%)	19 (79%)	7 (29%)

Micrococcus pyogenes var. *aureus* was the organism identified from two of the 24 patients with positive cultures, and *Micrococcus pyogenes* var. *albus* was found to be present in 22. A higher percentage of the acute group than of the chronic group had these organisms in the urethral exudate, but the difference is of no significance statistically. Only one strain was sensitive to penicillin and resistant to aureomycin; five were sensitive to both, and the remainder were equally divided between those re-

sistant to both and those resistant to penicillin and sensitive to aureomycin.

Aureomycin was used to treat all but two of the patients in this series. Fifteen follow-up prostatic cultures were made from acute patients. An aureomycin-sensitive organism either disappeared following treatment or changed to a resistant one. In no instance did an aureomycin-sensitive organism remain after treatment with that drug. The only patient in the series treated with penicillin showed before treatment a staphylococcus that was sensitive to both antibiotics, and after treatment a staphylococcus resistant to penicillin but still sensitive to aureomycin.

DISCUSSION

This study confirms the prevalence of staphylococci in nongonococcal urethral exudates; secondly, the data on sensitivity coincide closely with similar data available in the literature regarding the high rate of resistance in staphylococci to those antibiotics in widespread use. Lastly, follow-up cultures and sensitivity tests suggest that organisms develop resistance to an antibiotic drug during treatment with that drug. The impression was gained that treatment is most effective when instituted early and when the organism is one sensitive to the drug used.

In a few cases nonpathogenic bacteria other than staphylococcus were cultured, but these were not included in this study because of additional difficulty in identifying and testing them. By more thorough methods of taking specimens it is believed that a greater number of positive cultures would have been found. In all the patients with positive cultures in this series, however, the organisms were present in abundance.

If we can attribute the cause of nongonococcal urethritis to these rather nonvirulent organisms (no other specific causative agent having been discovered as yet), and if we assume that penicillin is a contributing factor, what might be the mechanism by which the infection begins? Penicillin by mouth could upset the bacterial equilibrium in such a way as to allow resistant organisms to prevail in the body and enter the lower urinary tract. This entrance might take place from the outside through the urethra, as in gonorrhea, or bacteria could come from the wall of of the colon or rectum by direct spread, or from a distant focus by way of the blood stream. If the access is internal, the intestinal tract seems the most likely source. Recently, cases of a staphylococcal enteritis following penicillin therapy have been reported.[10,11] Garrod has shown that, *in vitro,* penicillin in low concentrations actually stimulates the growth of staphylococci and some other bacteria.[12]

SUMMARY

In a study of nongonococcal urethritis in 55 men on duty with the Navy in the Far East, staphylococci were found in 44 percent of the patients. The organism was resistant to penicillin in 79 percent of the patients, and to aureomycin in 29 percent. The previous oral administration of penicillin as a venereal prophylaxis in the great majority of these patients is suggested as a factor favoring the growth of the staphylococci.

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The Complex Human Organism

Psychiatry might be defined as that specialty of medicine that deals with the incongruous. The psychiatrist attempts to alleviate the suffering resulting from disparities between a person's emotional needs and the characteristic ways in which he tries to satisfy those needs. Until the advent of dynamic psychiatry, the incongruous behavior of the mentally ill was usually considered to be inextricably bound to mysticism. Without doubt, the greatest advance in psychiatry within the last 100 years has been the discovery that the riddles of even the most bizarre and abnormal behavior can be understood in terms of the complex functioning of the human organism.

—BERNARD H. HALL, M. D.
in *Journal of the American Medical Association*, p. 615, Oct. 1953

MEDICAL RESEARCH IN THE DEPARTMENT OF DEFENSE

LOWELL T. COGGESHALL, *M. D.*
Chairman, Advisory Panel on Medical Sciences
Department of Defense

FROM the beginnings of the Department of Defense, the Secretary of Defense and his principal materiel agencies, the Munitions Board and the Research and Development Board, were generally conceived as co-ordinative bodies. While the Research and Development Board accomplished many useful things, it failed to achieve many of the important results that had been predicted by the more enthusiastic advocates of unification. It did represent a definite step in the evolution of the management of research and development by the Department of Defense. Its proper evaluation will come only after we gain better perspective with the passage of time.

The plan approved by Congress in June 1953 for the reorganization of the Department of Defense abolished the Research and Development Board by vesting its statutory functions in the Secretary of Defense. It clarified the responsibility of the Secretary of Defense with respect to the management of the military departments. It also provided for the appointment of six Assistant Secretaries of Defense without specifying their precise duties, but granted to the Secretary of Defense the authority for so doing.

The Assistant Secretaries were appointed in accordance with the recommendations contained in the Rockefeller Report. This report, while providing for an Assistant Secretary of Defense for Research and Development, is not very specific in its remarks pertaining to research and development. In recommending the dissolution of the Research and Development Board, it cautions that the Secretary of Defense "should not sacrifice such parts of the present functions of the Research and Development Board as are now operating satisfactorily." The report does set forth a philosophy for the operation of the Office of the Secretary of Defense, and it is therefore usable as broad guidance for the Assistant Secretary for Research and Development.

The existing momentum of the three armed services in research and development had to be maintained. Rather than wholesale reorganization from the laboratory level upward, assistance

Dr. Coggeshall is Dean of the University of Chicago School of Medicine.

and guidance to the three departments in their research and development operations was continued. Without in any way denying the ultimate responsibility and authority of the Secretary of Defense, there had to be a large degree of decentralization.

The responsibility of the armed services for research and development operations is recognized. This responsibility is a fundamental and inseparable phase of their over-all responsibility to provide themselves with proper weapons. The three military departments are considered to be individually responsible for planning and executing sound departmental research and development programs. The departments are to be responsible not only for determining that their programs are realistic in relation to the state of the art and the promise of success, and sound in relation to the military needs, but also for ensuring that their programs are sound in relation to those of the other military departments. Among those things considered to be primarily service responsibilities are inter-service action to provide for meaningful preproject co-ordination; to effect the easy transfer of technical information among service laboratories and their contractors; and to enter into joint research and development operations to reduce duplication, to promote efficiency, and to achieve economy.

The Assistant Secretary of Defense (Research and Development) reviews the departmental programs to determine that they are well co-ordinated and that collectively they constitute a sound and integrated over-all Department of Defense program. He has the responsibility for developing policies and establishing procedures to ensure the effective conduct of research and development operations by the military departments. The policies must provide for sound research and development objectives; for plans based on these objectives; and for budgets, facilities, and organizations to implement the plans. The Assistant Secretary (Research and Development) must see that all these things come to pass, not only by his own actions in policy preparation but also by review of the service operations, and by providing the leadership and guidance for those operations.

To facilitate co-ordination and to assist in the review of the research and development operations by the Secretary of Defense, in-service co-ordinating committees for the dozen or so major research and development technical areas were organized. One of these co-ordinating committees is in the field of medical sciences. Others in fields closely related to medical sciences are personnel and training, general sciences, atomic energy, and biological and chemical warfare. Each committee has a permanent staff of an executive secretary and certain designated

assistants. The chairmanship of the co-ordinating committees is vested in the three authorized deputy Assistant Secretaries of Defense (Research and Development).

COORDINATING COMMITTEE ON MEDICAL SCIENCES

The Coordinating Committee on Medical Sciences was officially established by Department of Defense Directive on 6 January 1954. It is provided as "a staff mechanism for achieving a sound, coordinated, and integrated research and development program in the field of medical sciences." The field of interest of the Committee includes aviation medicine, shipboard and submarine medicine, physiology, military and field medicine, psychiatry, atomic medicine, and other pertinent allied medical sciences. Committee membership includes the senior medical research representatives of the Army, Navy, and Air Force. Also included in its membership are the senior representatives of the Assistant Chief of Staff, G-4 Logistics, Department of the Army; the Office of Naval Research; the Director of Research and Development, Deputy Chief of Staff, Development, Department of the Air Force; and the senior military member of the staff of the Assistant Secretary of Defense (Health and Medical).

The Committee currently meets regularly once a month. It reviews plans and programs for (1) adequacy and proper balance, (2) interchange of research and development information among the departments, (3) specific agreements involving joint activities to achieve integration, (4) approval of major projects and important changes in direction or scope of such projects prior to initiation to ensure economy, and (5) advice to the Assistant Secretary of Defense (Research and Development) on needs for funding of research and development activities and facilities. In areas of common interest to more than one committee, the chairman of the committees concerned may arrange for joint collaboration.

It is planned that the Coordinating Committee will regularly receive advice and guidance from the Advisory Panel on Medical Sciences appointed by the Assistant Secretary of Defense (Research and Development) and may request advice from any advisory panel through the panel chairman. Departmental members of the Committee may also make such requests on behalf of their departments. The mode of collaboration between the Coordinating Committee and the Advisory Panel will be delineated by the Assistant Secretary of Defense (Research and Development) and implemented by the chairmen.

ADVISORY PANEL ON MEDICAL SCIENCES

The Advisory Panel on Medical Sciences was chartered in a Department of Defense Directive, dated 14 January 1954, to ensure that the Nation's best scientific and technical talents are applied to the planning and prosecution of the military research and development programs on medical sciences. The directive states: "This Panel shall consist of members designated by the Assistant Secretary of Defense (Research and Development) from among civilian scientists and experts. The number, selection, and terms of Panel members shall be such as, in the judgment of the Assistant Secretary of Defense (Research and Development) are required to achieve this purpose efficiently." The Assistant Secretary of Defense (Research and Development) has designated the Chairman of the abolished Committee on Medical Sciences, Research and Development Board, as the first chairman of the Advisory Panel on Medical Sciences.

The chairman has nominated, and the Assistant Secretary of Defense (Research and Development) has appointed a small group of consultants to be the steering group for the new organization. The new Advisory Panel will bring together many specialties not included by the former Committee on Medical Sciences, Research and Development Board. It is anticipated that nominees of the National Research Council, and the Armed Forces Epidemiology Board will be among those recommended to be consultants to the Assistant Secretary of Defense (Research and Development). Where subject matter is judged to be of sufficient interest to other agencies of the Federal Government, the Assistant Secretary of Defense (Research and Development) may designate as associate members qualified representatives formally nominated by the heads of such agencies.

The procedures for obtaining the advice and assistance of the Panel members will be as flexible as is consistent with the purpose for which the Panel was designed. The Panel chairman will work with the Assistant Secretary of Defense (Research and Development) and with the chairmen of related co-ordinating committees in the selection of groups of panel members to review and advise on important problems in their fields of competence. He will also assist in bringing this advice to the appropriate co-ordinating committee for consideration.

The Advisory Panel will study the military research and development programs within its field of interest in order to advise the co-ordinating committees. It will also report its findings and conclusions to the Assistant Secretary of Defense (Research and Development) and, in particular, will note its indorsement of, or its disagreement with the programs studied. In their studies, the Advisory Panel members will consider the broad features

of the program with particular reference to adequacy, timing, and technical balance in the light of military needs and the state of the art, with emphasis on important areas and problems rather than on detailed review of the entire field.

The Advisory Panel members will be available for the purpose of giving advice in special areas of interest to a single military department. Requests for such studies will be addressed to the Panel chairman through the departmental member of the Coordinating Committee on Medical Sciences.

Participation of Panel members on joint or ad hoc interarea panels will be arranged by the Assistant Secretary of Defense (Research and Development) or by the Panel chairman with the approval of the Assistant Secretary of Defense (Research and Development)

The Advisory Panel is provided with a secretary to assist the chairman and other members of the Panel in their work. He is responsible for keeping the Panel members informed on the military research and development programs of the extent necessary for their assigned tasks.

The executive secretary of the Coordinating Committee and the secretary of the Advisory Panel are titles vested in one person who is a doctor of medicine. He has an administrative assistant. Thus in one office, with one set of files, information is available to both Committee and Panel members.

Interdepartmental co-ordination in medical sciences has existed on an informal basis for several years through regular monthly meetings of the medical research heads of the Army, Navy, and Air Force. At these informal meetings preproject co-ordination functions are achieved and problems of mutual interest to the three services discussed, but no minutes are kept. This group is currently proving its effectiveness by pre-co-ordination of the meetings of the Coordinating Committee on Medical Sciences.

There are now two Assistant Secretaries of Defense interested in the field of medicine: The Assistant Secretary of Defense (Health and Medical) has cognizance of all medical matters except research and development, and the Assistant Secretary of Defense (Research and Development) over all research and development including medical research and development. The reason for including medical research under the Assistant Secretary of Defense (Research and Development) is necessitated by governmental organization wherein the budget for all research and development comes under his jurisdiction, and medical research is included in this budget. It is important for those responsible for medical research to have adequate representation

when budgetary determinations are made to ensure that a proper amount is allotted to medical sciences even though it be small in comparison to the total given to the field of military research. Because it is fitting and proper that medical representatives should be present to assist and advise the Assistant Secretary of Defense (Research and Development), co-ordination is necessary between the Assistant Secretary of Defense (Health and Medical) and Assistant Secretary of Defense (Research and Development).

On 15 March 1954 the steering group of the Advisory Panel on Medical Sciences to the Assistant Secretary of Defense (Research and Development) held its first meeting. This meeting was held jointly with the Advisory Council to the Assistant Secretary of Defense (Health and Medical). With such a promising beginning, it appears certain that co-ordination will be continued among the civilians as well as it has been accomplished in the past and currently is in effect among the staff representatives of the two Assistant Secretaries and the Coordinating Committee on Medical Sciences.

The new organization is now operating; only the test of time will prove or disprove its worth. Indications are that it is a vast improvement over the former Research and Development Board because a long chain of command and many months were required to effect a recommendation. Progress has been made; now decisions can be made and actions initiated almost simultaneously.

Prevention of Suicide

Half an hour ago someone in the United States committed suicide. Another has done so as these words are read; the average is a suicide every 30 minutes. These two persons are dead, and no further follow-up can help them. They have failed society, and society has failed them. But in the same half hour another 20 persons have attempted suicide. Now their stomachs are being emptied, wounds are being repaired, bullets extracted. These patients will be dismissed in the hope that they will never return. Some, however, will attempt suicide again and fail again; others will be among the yearly 22,000 persons who kill themselves in the United States. That number, incidentally, is almost exactly the number of American soldiers killed in Korea in three years of war. It behooves physicians, both professionally and as citizens, to learn how to help persons who might commit suicide.

—HERBERT BAUER, M. D.
in *California Medicine*, p. 424, Dec. 1953

GROUP THERAPY IN A MILITARY HOSPITAL

ROBERT D. TOWNE, *First Lieutenant, USAF (MC)*

INCREASING numbers of reports dealing with the application of group therapy technics to the treatment of hospitalized and ambulatory psychiatric patients have received prominent notice in recent medical literature. These technics vary from group participation in musical recreation and occupational therapy to psychodrama and psychoanalytically oriented group psychotherapy.

Loosely defined, group therapy has come to mean the treatment of two or more patients by one or more therapists using psychologic methods. It attempts to encourage the development of meaningful interpersonal relationships between individual members of the group as well as between patient and therapist, thereby resulting in considerable economy of time and effort. These economies are of the utmost importance in the military service. Recent wartime experience has demonstrated that the numbers of patients needing some sort of psychiatric treatment and disposition place a constant strain on available trained personnel. The threat of a major catastrophe further forewarns that some efforts need be made to cope with the large numbers of psychiatric as well as general medical casualties that may be anticipated. Present conditions indicate that even in peacetime the load of psychiatric patients drawn from the armed services frequently creates a considerable backlog awaiting professional attention. There is some indication that the extensive use of group therapy programs may not only increase the turnover rate for patients receiving treatment, but will add a therapeutic technic that seems well adapted to the more limited goals of military psychiatry.

NEED FOR GROUP THERAPY

The psychiatrist in the military setting finds general emphasis placed on the diagnosis and disposition of the patient, the governing principle being to determine whether or not he is able to perform further military duty. Attempts at treatment are necessarily made on a short term basis. The patients are either returned to active duty or separated from the service after a comparatively short hospitalization, as administrative procedures necessary in carrying out these plans leave insufficient time for individual treatment.

From U. S. Air Force Hospital, Sheppard Air Force Base, Tex.

The neuropsychiatric centers in the armed forces apply the standard somatic therapies, and efforts are made to furnish occupational and recreational activities for groups of patients. In attempting to create this therapeutic milieu for the hospitalized patient, however, some difficulties arise. Ward personnel, both professional and lay, respond to the general therapeutic de-emphasis by devoting their time to keeping the wards clean and neat, and the patients from becoming "troublesome." The psychiatrist's limited participation in therapy reinforces this reaction. Because the medical officer does not seem to be doing much in the way of treatment, the ancillary personnel may come to regard themselves as custodians or guards. Sympathetic concern for the patient's illness and suffering is poorly developed, and, because the psychiatric wards often seem to function as a haven for these maladjusted persons, the compensatory gains the patient extracts from his hospitalization arouse the staff's resentment. As the personnel, restricting themselves to menial duties, develop hostility toward the patient because of his escape from the rigors of military duty, morale on the neuropsychiatric service tends to decline. These feelings are rapidly communicated to all the patients, who respond with further hostility, passive defiance, or withdrawal. Once established, this circular interaction tends to perpetuate itself, and the probability of establishing a therapeutic atmosphere becomes more and more remote.

ADVANTAGES OF GROUP THERAPY

In the introduction of group therapy it is clearly established that its purpose is to *treat* the patient. The ward physician, by sitting in group meetings with the patients, lends concrete action to support his therapeutic philosophy and attitude. In this hospital the personnel on the ward are encouraged to attend the group sessions. For the most part they have been silent participants, but in several instances they have become members of a group for varying periods of time. The nurses and medical airmen who observe or participate in group meetings gradually become willing to accept the reality of the patient's mental illness and his need for sympathetic understanding. Resentment in the ward staff growing out of the patient's absence from duty is replaced by a more active participation in finding a solution for his problems. Once established on the hospital ward, the group therapy program can continue to function as a guide for the desired therapeutic attitude on the part of the staff, and to serve as a method whereby the psychiatrist can actively participate in an attempt to establish corrective interpersonal relationships in the patients under his care.

DEVELOPMENT OF GROUP PROCESS

The inauguration of a group therapy program in the neuropsychiatric service of this hospital has provided an opportunity for studying the development of the group process as well as for observing the effect of such a program on ward physicians and personnel. The psychiatric service was made up of two open wards (33 beds each), two closed wards (25 beds each), and an outpatient department. The patient population consisted of a rapidly fluctuating number of men with neurotic, psychotic, and psychopathic disorders. For the most part, the routine diagnosis and treatment of the patients functioned smoothly. Moderately active occupational and recreational therapy programs were in progress, and electroconvulsive therapy was available for selected patients. Initially, the ward psychiatrist saw each newly admitted patient individually for the purpose of establishing a tentative diagnosis and planning his disposition. In addition, some patients were seen individually within the limited time available to the ward officer. Once the diagnosis was established, most patients would continue as ward members, participating to a varying extent in the occupational and recreational programs while awaiting return to duty or separation from military service.

Group therapy sessions were instituted on all the wards and in the outpatient department, the details being determined by the individual ward physician. As the program stabilized, groups of four to eight patients met regularly with their therapist for about 40 minutes one to three times per week. The frequency of meetings had been predetermined, for the most part, on the basis of the time available and the goals sought.

ATTITUDES TOWARD GROUP THERAPY

Initial group meetings on all the wards were characterized by a similar "testing-period." The patients attempted to find out if the doctor meant what he said, that "we can talk about anything here." As a commissioned officer the psychiatrist was an authoritarian figure with real as well as fantasied powers. The airman-patient, officer-psychiatrist relationship presented many new and difficult problems. The enlisted man brought with him to the doctor-patient relationship the conditioned need for approval from a military superior. Military society often imposed this need on an unwilling recruit who had already demonstrated significant conflicts with authority figures, and this need for approval often led the patient to suppress and disguise disturbing emotional problems that threatened his self-esteem and social equilibrium. This mechanism inhibited attempts to uncover the painful areas

of emotional involvement, and resulted in the initiation of efforts directed toward effecting a change in the environment. Most of the staff psychiatrists, having been trained in the technics of more permissive psychodynamic psychotherapy, found the authoritarian role uncomfortable and unwieldy. Feeling that the authoritarian aspects of the relationship suppressed important material, distorted communication, and forced the physician into a particular and undesirable role, the group therapist attempted to create a permissive atmosphere. Thus, during the initial testing period, although there were long silences as the channel of communication broadened from the stereotyped military responses of the "yes, sir" and "no, sir" type, questions directed to sound the therapist's views on military life and discipline were early forthcoming. There were experimental trials by some patients in expressing hostility or retreating into nonparticipation. One series of group meetings led by a psychologist who was a noncommissioned officer rapidly evolved into heated and bitter discussions, which on one occasion came near to an open fight. At that time the speculation was entertained that the therapist's noncommissioned status had allowed for the development in this group of more uninhibited communication, with less authoritarian conflict.

GROWTH OF PATIENT PARTICIPATION

In all groups the early tentative testing developed increased ventilation of complaints and criticisms, which varied from dissatisfaction with the physical surroundings to resentment of inattention and inadequate symptomatic relief. Many of these complaints centered about the patient's job, his commanding officer, geographic location, or lack of promotion. After several weeks of such ventilation in a permissive setting, the complaints became milder, and some suggestions were offered by group members to increase further their comfort and treatment. Subject matter gradually evolved from bland to more emotionally laden material, and some interest in common problems and their solution was periodically expressed. As the meetings progressed, patients began to form loyalties. There were those who sided with the hospital and the *status quo,* and those who were opposed. The therapist often found himself defended from attack by patients who seemed to function as "assistant group leaders." Their contributions, evidently motivated by a desire to obtain the leader's approval and to reduce group tension, favorably stimulated group cohesion. This development of assistant leaders permitted a more passive participation by the therapist, and encouraged the evolution toward a leaderless group. New patients who entered the group program with a desire to test the authoritarian system tended to receive support from the group members already integrated.

CLOSED WARD THERAPY

Observations made of the developing group process pointed up variations encountered in the open wards as compared with the closed wards. Many of the differences noted in the responses of the patients, as well as in those of the physician, were seemingly determined by the severity of the individual's illness and the psychiatrist's reaction to it. In general the closed wards contained the more severely ill patients, and an attempt made to have the psychotic patients on these wards meet in homogeneous groups revealed several advantages of this method. Because the psychotic patients required longer to form social relationships and were hospitalized for a greater period of time, formation of a group among them produced stabilization. In addition, the technics employed with psychotic patients often differed from those used with neurotics and others.

Participation in closed-ward group meetings was not always on a verbal level. The group atmosphere allowed for the silent participation of some of the more withdrawn patients. Many of these men, finding safety in numbers, seemed less threatened by the permissive group atmosphere. Group membership also helped to shorten the time needed for the re-establishment of social relations. This was especially rewarding in those instances where frequent interviews were impossible within the restricted framework of treatment. The group process seemed able, at times, to assist the more withdrawn, nonverbal members in their reawakened efforts at communication.

OPEN WARD THERAPY

The open ward groups presented somewhat different problems. For the most part these patients were not severely ill; many were suitable for outpatient management, but had been hospitalized due to a lack of facilities at their own air base.

A constant problem was the lack of motivation for improvement. The realistic gains of illness enabled patients to secure sympathetic hospital care and even escape from unpleasant duty. Often patients, through their strong need to avoid anxiety, compounded this difficulty by attempting, unconsciously as well as consciously, to manipulate the environment. Once hospitalized, many of these men became difficult to rehabilitate. Symptoms would rapidly recur when they were faced with return to duty, and their ability to give up some of their dependent gratifications decreased with time.

In this setting, group therapy helped to break down the omnipresent barriers to communication. The permissive group approach encouraged the expression of feelings within the group meeting.

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Within this microcosm the routine problems of ward administration, such as the assignment of duties to each patient and the adherence to ward rules, were introduced, discussed with considerable feeling, and a group decision reached. Such a procedure frequently allowed the men to accept their roles as airmen-patients in a military hospital more willingly, and without arousing undue authoritarian conflict. In some instances the group meetings functioned as a screening process to determine which patients were motivated toward treatment.

OUTPATIENT THERAPY

The outpatient group program developed slowly, and was formed with the intention that it would serve two principal ends: (1) to provide continuing treatment for ambulatory patients who needed supportive therapy and ventilation: and (2) to act as a screening method to eliminate those patients appearing at the neuropsychiatric clinic who were not motivated toward treatment. It was hoped that the most suitable candidates for psychotherapy would be identified to receive individual attention. For a time the outpatient group was led by a psychiatrist; however, members of the psychology staff were gradually integrated into the program, and later conducted the groups with minimal supervision.

For the most part no significant numbers of candidates suitable for individual treatment have been forthcoming from the outpatient group. This seemed to be a function both of the type of patient seen in the outpatient clinic, and of the inefficient integration of the outpatient group therapy program into the neuropsychiatric service as a whole. There has been some success in assembling those patients desiring ventilation and support into a group, thus slightly reducing the demands for more individual attention. Patients who ventilate strong feelings about the military service and about their personal plight, and who then find other men with the same difficulties, seem able to derive some support from the realization that others have similar problems, and seem benefited by the opportunity to discuss them in a permissive atmosphere. To the extent that this method tends to discourage the dependent relationship developed in individual therapy, it appears to be of particular value in military patients.

DISCUSSION

In a group therapy program in a military hospital membership of the group is constantly changing. This situation has its disadvantages because it inhibits the development of strong group identity feelings, and acts as a limiting factor in determining the depth and magnitude of emotionally laden material brought forth for discussion. The transitional quality of life in the service is further

re-enforced by its reflection in the fluctuating membership of the group.

Paradoxically, the existence of a group program also seems to offer some elements of stability in a rapidly changing environment. The therapeutic attitude and continuing group treatment continues to function, incorporating new members among the patients and professional staff as the occasion demands. Assignment changes for the professional and subprofessional staffs exerts a considerable influence on any attempted treatment program. Any effort directed toward providing a medium for continuing therapeutic treatment seems worth while. Such a program should permit a smooth integration of all new personnel entering the ward setting. Selected psychologists, social workers, nurses, and medical technicians, by becoming capable leaders of patient groups, can relieve the professional staff of the burden of large numbers of patients awaiting treatment. Ancillary personnel may also receive valuable training by attending group meetings where they are able to observe the desired attitudes and technics as applied to patients.

The research possibilities of group therapy programs are receiving attention at present. Efforts are continually made to determine if the group process can serve as a model for other significant interpersonal relationships. In the military service considerable information may be gained by studying the psychology of military groups and their adjustment problems. Multiple therapists, or leader and observer teams, co-operating in group psychology research can assemble much meaningful and increasingly objective data.

SUMMARY

In a description of the development of a group therapy program on the neuropsychiatric service of a military hospital, mention is made of the advantages afforded in terms of economy of time and effort, creation of a therapeutic atmosphere, and integration into a teaching and research program. The early development of the group process as observed in this setting as outlined demonstrates the authoritarian conflicts and other problems created by the transitional environment characteristic of a military setting.

I had six honest serving men—They taught me all I knew: Their names were Where and What and When—and Why and How and Who.
—Rudyard Kipling.

A COMBAT ZONE NEUROPSYCHIATRIC TREATMENT CENTER

DAVID H. WILSON, *Major, MC, USA*

DURING the latter part of World War II, with the assignment of a psychiatrist to the staff of the division surgeon, the principle of forward treatment of neuropsychiatric casualties was established. Because of the relatively mobile type of warfare involved and a high incidence of true combat exhaustion, treatment centers were set up at corps level for those patients requiring more than a short period of recuperation. In the postwar organization of psychiatric care at army level, these centers were maintained on the basis of their success in the previous war.

The advent of a stable combat situation in Korea, however, radically changed this requirement for efficient handling of psychiatric casualties. Because combat stress was intermittent rather than prolonged, true combat exhaustion constituted a much smaller portion of the patients treated by the division psychiatrist. The conditions seen were generally of a milder nature, and the static position of the division enabled the psychiatrist to spend more time with each patient. As a result, so few patients required extensive rear-echelon treatment that to establish a treatment center at corps level would have been unnecessary.

Casualties in forward areas requiring further psychiatric care were sent directly to evacuation hospitals but the flaws in this system soon became apparent. Adequate rehabilitation regimen in the evacuation hospital was difficult to maintain because trained psychiatric personnel were scattered throughout the army area and one unit could be overburdened while another was not. Frequently casualties had to be sent hundreds of miles to the rear for bed space and one of the greatest disadvantages of this dispersion was the removal of the casualty from a military setting to a medical installation.

STRUCTURE OF THE CENTER

In the second year of the Korean conflict a psychiatric medical detachment was activated to function as the neuropsychiatric treatment center for the Eighth Army. The physical layout of the

From Headquarters, U. S. Army Forces, Far East, APO 343, San Francisco, Calif.

professional component of the center consisted of a clinic with offices for the professional and clerical staff, a dispensary, one closed ward, one restricted activities ward, one to four open wards (depending on patient load), an admission and disposition tent, and a training tent. The clinic and closed ward were housed in quonset huts, and the others in winterized tents. The capacity was about 120 beds, of which 20 were closed ward beds.

FUNCTION

The primary mission of the unit was the rapid treatment and rehabilitation of psychiatric casualties in a nonmedical environment. In order to accomplish this task the following were organized: the admission and disposition, inpatient, outpatient, psychiatric social work, clinical psychology, rehabilitation, and neurology sections; the closed and semiclosed wards; and the dispensary.

Patients admitted to the hospital were immediately impressed with two ideas: first, they were to remain as soldiers in a military setting and were not to be considered disabled; and second, brief hospitalization was to prepare them for return to full duty. Regular duty uniforms were worn, the wards were identical to ordinary barracks, and reveille, mess, police details, and formations were conducted with emphasis on physical reconditioning, including calisthenics, hikes, drill, and supervised athletics. Recreation was limited, and passes were restricted to essential business. In the closed ward, however, patients wore pajamas and their meals were served to them. Patients on the semiclosed ward did not participate in the rehabilitation program because of their physical or neurologic conditions. A few were severely disabled neurotic patients not yet ready for the activities program.

RECORDS

Complete records were maintained on all patients. When a patient left the unit, copies of all pertinent data were filed and cross-indexed, including final summary, data from the unit or previous medical records, and a mimeographed worksheet containing all significant administrative information. A copy of the final summary was sent not only to the referring physician, but also to the patient's unit commander, the unit surgeon, and, if the patient was evacuated or transferred, to the next medical facility.

THERAPY

Treatment, as a rule, was direct and practical. Group therapy was inadvisable as the average duration of hospitalization was too short to allow the development of any group identity. Thera-

peutic adjuncts such as amobarbital sodium (amytal), thiopental sodium (pentothal), hypnosis, et cetera, were used sparingly and usually for diagnostic rather than therapeutic purposes. The patient's past history was used by the physician more to understand behavior patterns rather than to gain a "deep" or "insight" therapeutic approach.

RESULTS

During the first year of operation, 2,204 patients were admitted to and discharged from the unit. Of this number, 18.8 percent (414) were evacuated to Japan; 3.8 percent were transferred to other hospitals in Korea; 17.8 percent were returned to limited duty, and the remaining 59.6 percent were returned to full duty, for a total of 77.4 percent returned to duty. The inpatient census varied from 25 to 72 with an average daily census of 52.3. The average duration of hospitalization was six and one-half days. Of all patients admitted, 37.6 percent were from a combat area—"combat area" in this case being defined as "true" combat in a 4 point zone; that is, no farther from the main line of resistance than the infantry battalion headquarters. The other 62.4 percent were from 2 and 3 point areas (regimental, division, corps, and army level). During the same year, 1,078 other patients were seen in consultation in the outpatient clinic.

TABLE 1. *Diagnostic breakdown of patients seen*

Diagnoses	Percent of patients
Character and behavior disorders	46.5
Psychoneuroses	24.7
Psychoses	16.0
No disease found	10.8
Neurologic diseases	2.0

A breakdown of detailed diagnoses is beyond the scope of this article but a general concept of the types of patients treated can be gained from a categorical summary of diagnoses (table 1).

Included in the "no disease found" category are not only those patients in whom no disease was evident but also those with other medical or surgical diagnoses, and others given clearance for administrative procedures. The 16 percent of patients with psychoses account for all but 2.8 percent of those who were evacuated.

OTHER FUNCTIONS OF THE UNIT

In addition to its primary mission, the center accomplished certain other services. All psychiatrists assigned to the Eighth Army and Korea Communication Zone were first stationed at this center, either on temporary duty en route to their organization or on a permanent assignment while awaiting a vacancy in a division or evacuation hospital. This uniform indoctrination in combat psychiatry standardized the general policy in handling psychiatric patients throughout Korea and established a close personal working relationship among the various installations. When the staff was at full strength, it provided a pool of trained personnel who could be called on in case of sudden need elsewhere.

Because of its centralized location, the unit was host at the periodic psychiatric meetings and was used to give training in the fundamentals of neuropsychiatry and the practical aspects of military psychiatry, not only to U. S. medical officers but also to those of the Republic of Korea Army. Groups of five Korean doctors were assigned to the center for a six-month period of training. Members of the staff visited the local ROKA hospital and acted as consultants for their psychiatric service.

SUMMARY

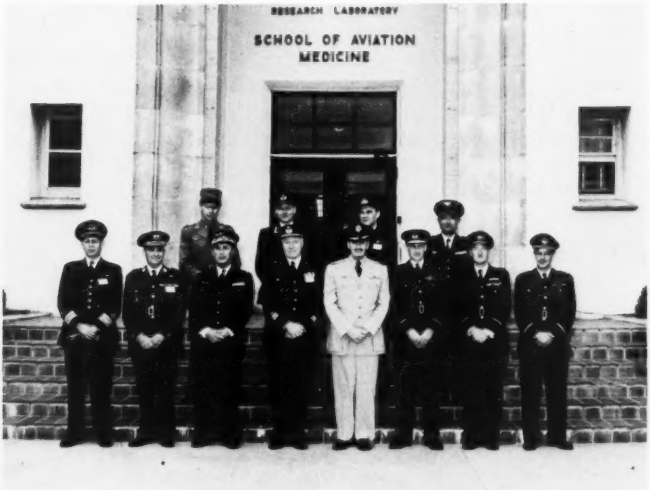
The organization, in the Korean conflict, of psychiatric treatment in a combat area similar to that set up during World War II was found to be inadequate in coping with the new problems of a static situation. A psychiatric treatment center was established which, in its first year of operation, discharged about 2,200 inpatients, returning more than 75 percent to duty. During the same period about 1,100 outpatients were treated. Of the 3,300 patients treated, nearly half had character and behavior disorders. It is believed that this type of unit makes the most efficient use of trained professional manpower in the treatment of psychiatric casualties in a combat area.

The dental profession and other interested agencies have a responsibility to warn the public of the cariogenic property of sugars and their solutions and to point out that many of these products contain no highly important nutritional factors. Research should be encouraged on the part of producers of sweetened beverages and confections to support the development of new or improved procedures or agents for the prevention and control of dental caries which may result from the use of their products.

—From *Journal of the American Dental Association*, p. 415, Oct. 1953

USAF SCHOOL OF AVIATION MEDICINE HOST TO SURGEONS GENERAL OF 12 AIR FORCES

Accompanied by Major General Harry G. Armstrong, Surgeon General, U. S. Air Force, the chief medical officers of 11 foreign air forces recently visited the U. S. Air Force School of Aviation Medicine at Randolph Air Force Base, Tex., where they were the official guests for two days of the commandant, Brigadier General Edward J. Kendricks, USAF (MC).



The surgeons general of 12 air forces photographed in Texas. Front row, left to right: Col. Gustaf Severin, Sweden; Brig. Gen. Miguel Lafont, Spain; Med.-Gen. Pierre R. Labarthe, France; Lt. Gen. Gennaro Pera, Italy; Maj. Gen. Harry G. Armstrong, United States; Air Marshal Sir James Kilpatrick, Great Britain; Air Vice Marshal E. A. Daley, Australia; Air Commodore A. A. G. Corbet, Canada. Back row: Maj. Klaus Wiesinger, Switzerland; Col. Olaf Nyby, Norway; Col. Helge Smith, Denmark; Col. Duk Seung Chang, Republic of Korea.

General Armstrong and his party, which included 19 high-ranking air force medical officers of other countries, departed from Washington, D. C., by military aircraft after attending the 25th anniversary meeting of the Aero Medical Association. The group also visited the Air Force Aero Medical Laboratory at Wright-Patterson Air Force Base, Ohio, and the Gunter Branch of the School of Aviation Medicine, at Gunter Air Force Base, Ala.

Iliac Horns

A Manifestation of Hereditary Osteo-onychodysplasia

JOHN C. BATES, *Major, MC, USA*

IN 1946 Fong[1] presented a case demonstrating "symmetrical, bilateral, central, posterior iliac processes" which he called iliac horns. Doub,[2] in an editorial addendum, presented a roentgenogram demonstrating the same processes. These posterior iliac horns were not considered of particular significance except for their unusual appearance. Thompson and associates[3] in 1949 presented four cases of posterior iliac horns, and proved they were associated with a recognized hereditary dysplasia. Turner[4] described several cases of hereditary arthrodysplasia associated with hereditary dystrophy of the nails. He investigated two families in which 35 of 79 members were affected. With the aid of illustrations and roentgenograms he reported in detail the defects noted; however, he did not specifically describe the posterior iliac horns, although they can be seen by close examination of a reproduction of a roentgenogram in his article. Aschner[5] discussed the genetics of these hereditary dysplasias, and concluded that defects of the nails, patellas, and radial heads constituted a typical hereditary syndrome. He apparently did not consider the pelvic findings of importance. The Firth family in England, observed by Lester,[6] consisted of three generations totaling 16 persons, of whom seven had a familial dyschondroplasia associated with anonychia and other deformities. Lester believed that deformities of the ilia (not posterior horns) and scapulas were part of the congenital hereditary syndrome and that a peculiar pigmentation of the iris might also be connected with the disease.

Montant and Eggermann[7] discussed this hereditary syndrome, and called particular attention to the fair, blue-eyed members of these families as being particularly susceptible to the defects. This point was not supported by other authors, and the patient presented here was brunette with dark-brown eyes. Roeckerath[8] in reporting on a series of cases believed that patients with hereditary osteo-onychodysplasia might present some or all of the following findings:

From U. S. Army Hospital, Fort Campbell, Ky.

1. *Dysplasias of the pelvic girdle:* Iliac horns, hypoplasia of the ilia, bowed sacrum with hyperlordosis of the lumbar spine, bilateral protrusio acetabuli, and coxa valga.

2. *Dysplasias of the knee joints:* Absence of or hypoplasia of the patellas, hyperplasia of the internal condyle of the femur, and hypoplasia of the fibular head with stunting of the tibiofibular joint.

3. *Nail dysplasias:* Thumb most constantly involved; index finger next most commonly involved. (Toenails appear to be spared.)

4. *Anomalies of pigmentation of the iris, Lester's sign.*

5. *Dysplasias of the elbows:* Hyperplasia of the ulnar epicondyle of the humerus, hypoplasia of the capitellum, and hypoplasia or agenesis of radial heads.

6. *Foot dysplasias:* Hypertrophy of the malleoli and club feet or flat feet.

Figure 1. Intravenous pyelogram demonstrating iliac horns.

7. *Arm and hand dysplasias:* Madelung's deformity with dislocation of the lunate; hypertrophy of the styloid process of ulna;

hand may be more plump than usual with clinodactyly or camptodactyly, and sometimes hyperflexion of the fingers.

8. *Shoulder girdle dysplasias:* Hypoplasia of the scapula, tendency to dislocation and fracture of the clavicle, and flattening of the humeral head and bicipital sulcus.

9. *Hyperostosis of the frontal bone.*

Figure 2. Detail of anteroposterior view of single iliac horn.

He noted that the ribs and vertebras did not appear to be involved, and that vertebral anomalies in these families were no more frequent than in the general population. A study of the reported cases and of my own patient indicate that certain characteristic defects[9] such as dysplasia of the thumb nails, abnormalities of the patellas, limitation of motion of the elbows, and posterior iliac horns are more apt to be consistently present.

CASE REPORT

A 25-year-old man entered the hospital complaining of low back pain. Because of albuminuria, an intravenous pyelogram was done and posterior iliac horns were noted (figs. 1 and 2). A complete bone survey showed: (1) spondylolisthesis of the fifth lumbar vertebra; (2) iliac horns located posteriorly (fig. 3); (3) bilateral hypoplasia of the patellas (fig. 4); (4) bilateral incomplete development of the semilunar notches at the elbows and partial subluxation of the radial heads (fig. 5); (5) minimal hyperostosis frontal bone of skull; and (6) old well-healed fracture of the right clavicle. The bones of the shoulders, wrists, hands, ankles, feet, and thoracic and cervical spines were normal.

Figure 3. Oblique view which demonstrates the iliac horns, lying posteriorly, and the defect in the fifth lumbar vertebra.

The patient had marked bilateral hypoplasia of the thumb nails (fig. 6) and longitudinal striation in the nails of the index fingers, but was more pronounced on the right than on the left (fig. 7). He had bilateral limitation of extension of the arms at the elbow joints. The patellas were small, and located laterally when standing. The patient had pain in the back directly over the fifth lumbar vertebra with some limitation of motion. This patient, a brunette with extremely dark coloration and very dark eyes, had no unusual pigmentation of the iris. The albuminuria was orthostatic.

The patient was one of five siblings; three boys and two girls. His mother, who had no such physical defects, revealed that her husband had hypoplasia of the nails, limitation of motion of the elbows, and weak knees, and that all of her children had abnormal thumb nails, could not straighten their arms out completely, and had weak knees. She commented that her husband was an only child, and that she did not know her husband's parents.

Figure 4. Lateral view of the right knee showing hypoplasia of the patella.

Unfortunately, none of the siblings were available for examination; however, it is likely that they also have the same condition, hereditary osteo-onychodysplasia.

SUMMARY

In a patient with hereditary osteo-onychodysplasia who showed many of the dysplasias associated with this syndrome, the hered-

Figure 5. Right elbow showing hypertrophy of the ulnar epicondyle, a shallow semilunar notch and a partial subluxation of the radial head.

itary background was established from the history and by correspondence with his mother. This syndrome is a dominant, non-sex-linked disorder. The defects most apt to be present in a

Figure 6. Dysplasia of the thumb nails.

Figure 7. Dysplasia of the right thumb nail and index finger.

patient are dysplasia of the thumb nails, abnormalities of the patellas, limitation of motion of the elbows, and posterior iliac horns.

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Warfarin Poisoning

Report of Fourteen Cases

PHILIP F. LANGE, *Captain, MC, USAR*
JOHN TERVEER, *Captain, MC, USAR*

THE study and development of anticoagulant therapy has been one of the major achievements of recent medical research. By expanding the structural formula of bishydroxycoumarin (dicumarol) the Wisconsin Alumni Research Foundation developed several related compounds, including 3-(alpha-acetonylbenzyl)-4-hydroxycoumarin, known as warfarin compound 42 or warf-42.

Warfarin is widely used as an efficient rodenticide[1,2] by the Army and civilian agencies. It is available in the form of a 0.5 percent powder with corn starch as a diluent. This can be mixed with additional bait such as corn meal, ground rice, or bread crumbs, which is readily accepted by rats and mice. Rodents have been observed, both in the laboratory and in the field, trying to feed on the bait even when they were so affected by the drug that they lacked the strength to stand.

Warfarin is readily absorbed from the intestinal tract. Its physiologic effect is based on its dual mode of action; inhibition of prothrombin formation and capillary damage. This latter has been termed the "toxic factor" of warfarin and in this respect differentiates it from other anticoagulants. Warfarin, like bishydroxycoumarin, has a cumulative effect. A single large dose of warfarin (100 mg. per kg. of body weight) attains its maximum effect in rabbits from four to six days. Recovery usually is complete by the eleventh day.[3]

With the exception of two reported suicide attempts,[4,5] all information on the properties of warfarin has been obtained through laboratory experiments on animals. The lethal dose estimated for man is 50 mg. per kg. of body weight, which means that a 150-pound man would have to ingest at one time 1.54 pounds of the warfarin concentrate (0.5 percent warfarin) available on the market, or 3.5 grams of the active ingredient, or 30 pounds of mixed rodenticide bait (0.25 percent warfarin). Repeated daily doses, however, would have cumulative effect.

From 2d U. S. Infantry Division, Korea. Dr. Lange is now at 1923 S. Cedar St., Lansing, Mich.

In Korea, the control of rodents by warfarin mixed with corn meal has been consistently stressed by preventive medicine units to reduce the possibility of United Nations troops contracting rodent-borne diseases, notably Weil's disease, relapsing fever, typhus, and possibly hemorrhagic fever. Large quantities of the mixed bait have been disseminated for this purpose.

In this report of warfarin poisoning among civilian Koreans, 14 persons in one family were affected, and two fatalities resulted. The mixed corn meal rodenticide had been discarded hurriedly by a battalion during a tactical move, but was recovered by a Korean and later sold to the family mentioned.

A total of 50 pounds of the mixed rodenticide was consumed in 15 days. Four pounds of it were mixed with an equal amount of rice, allowed to ferment, and the resulting liquid was drunk by the four male members of the family. The remaining 46 pounds were consumed in bread, cake, or gruel. About three pounds were consumed daily by the family for 15 days. The total amount of warfarin consumed was 5.8 grams.

The family's two meals a day consisted mostly of warfarin corn meal, and for two members it was their entire diet. The approximate amount of warfarin eaten by each person in a day remained the same and was estimated from the size of the daily portion each received.

About seven days after ingestion began, the first symptom noted in nine of the patients was ecchymosis. Epistaxis and gum hemorrhages occurred in 10 patients beginning the eighth day, and hematuria in two patients. Gross blood was found in the stools of two others, although all those who bled from the nose and mouth had black stools at one time or another. One patient, 70 years old, had a hemorrhage into his subdeltoid bursa.

CASE REPORTS OF FATALITIES

Case 1. A 19-year-old Korean youth, previously in good health, ate warfarin corn meal exclusively, amounting to an average daily ingestion of 50 mg. of warfarin (about 0.83 mg. per kg. of body weight per day). On the eighth day, after ingesting 350 mg., ecchymotic spots appeared on his arms and legs and bleeding from the nose and gums began, which continued until his death on the fifteenth day after total ingestion of about 750 mg. of warfarin (about 12.5 mg. per kg. of body weight). Although weakness increased as his blood loss increased, his appetite remained excellent, and because he did not associate his illness with his food he continued to eat his regular amount of corn meal up to the time of death. He did not receive any treatment because the family did not seek aid until after his death.

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TABLE 1. *Summary of 12 nonfatal cases of warfarin poisoning*

Age	Sex	Amount of warfarin ingested				Symptoms
		Mg. per day	Approximate mg. per kg. of body weight per day for 15 days	Total mg. ingested	Approximate total mg. per kg. of body weight ingested	
70	M	20	0.33	300	5.	Hematuria and melena started sixteenth day and stopped eighteenth day. Pain and swelling in right subdeltoid also occurred.
66	F	20	0.33	300	5.	Ecchymosis on arms and thighs appeared on the fifteenth day and was accompanied by bleeding from gums.
37	M	20	0.29	300	4.4	Bleeding from the gums began on the fifteenth day, subsided, and then recurred with severe generalized abdominal and chest pain on seventeenth day.
22	M	20	0.31	300	4.68	Bleeding from the gums occurred on the fifteenth day and abdominal pain and melena on the eighteenth day.
8	F	30	1.33	450	20.	Ecchymosis appeared on the eleventh day and bleeding from the gums on the thirteenth day.
6	F	20	1.1	300	16.66	Ecchymosis occurred on the thirteenth day.
34	F	20	0.33	300	5.	Gums bled on the fifteenth day.

TABLE 1. *Summary of 12 nonfatal cases of warfarin poisoning*—Continued

Age	Sex	Amount of warfarin ingested				Symptoms
		Mg. per day	Approximate mg. per kg. of body weight per day for 15 days	Total mg. ingested	Approximate total mg. per kg. of body weight ingested	
12	F	20	0.71	300	10.7	Generalized ecchymosis appeared on the sixteenth day.
4	M	20	1.17	300	17.6	Generalized ecchymosis appeared on the sixteenth day.
19	F	40	0.8	600	12.	Ecchymosis developed on the seventh day. Bleeding from the nose and gums started on the eighth day. Severe shock.
29	F	40	0.727	600	10.9	Hematuria and bleeding from the gums began on the fourteenth day.
11	F	40	1.45	600	21.8	Ecchymosis developed on the seventh day and bleeding of the gums on the thirteenth day.

Case 2. A three-year-old Korean girl, ate a daily average of 30 mg. (about 2.06 mg. per kg. of body weight per day) of warfarin for 15 days. The total amount of warfarin ingested from the corn meal was 450 mg. (about 31 mg. per kg. of body weight); and, in addition, she was breast fed four or five times daily by her mother, who also ingested about 40 mg. of warfarin a day. On the eleventh day ecchymosis appeared on her forehead and, in spite of the fact that warfarin corn meal feedings were stopped on the fifteenth day, a massive nasal hemorrhage occurred on the seventeenth day. The parents were unable to bring the child through the mountains to the aid station, and she died untreated six hours after the onset of the hemorrhage.

The remaining cases are summarized in table 1.

COMMENT

By accident a family of 14 obtained possession of 50 pounds of warfarin-treated (0.25 percent) corn meal. Because other food was scarce the corn meal mixture was their main diet for 15 days. The symptoms and signs which they developed closely followed in time and order those of laboratory animals on a similar diet. The children seemed to be more resistant to the effect of warfarin than the adults. The high incidence of malaria and intestinal parasites among Koreans, by causing a chronic state of low-grade blood loss, may have decreased their resistance to warfarin. It was seven days, however, before symptoms appeared, 15 days before a death, and, in spite of inadequate vitamin K therapy and the use of citrated blood instead of fresh whole blood, the 12 patients who received treatment recovered within nine days after the ingestion of warfarin was stopped.

Similar incidents could occur in any area where starvation is endemic and large amounts of warfarin are in a vehicle palatable to humans. Marking the containers in the native language or with a skull and crossbones would not necessarily prevent a repetition of this because illiteracy, incomprehension of the poison symbol, or transfer of the material to another container by an unwitting person would destroy the value of any such markings. If the vehicle were unpalatable to humans or had an offensive odor, however, people would be much less likely to eat it and at least would suspect their food if they became ill shortly after eating it. The use of cracked rather than ground grain or charcoal as a coloring agent would be a helpful safety measure, but would not change acceptance of the bait by rodents.[6]

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U. S. DELEGATION DEPARTS FOR NATO MEETING

Members of the United States delegation to the medical planning conference of the NATO nations in Paris, 10 - 12 May 1954, photographed on their departure by air from Washington National Airport. From below: Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical); Rear Admiral Lamont Pugh, Surgeon General, U. S. Navy; William S. Middleton, M. D., Dean of the University of Wisconsin Medical School and a member of Dr. Berry's Civilian Health and Medical Advisory Council; Major General George E. Armstrong, Surgeon General, U. S. Army; and Major General Harry G. Armstrong, Surgeon General, U. S. Air Force.

Reconstruction of Tracheal Lumen by Skin Graft and Cicatricial Diaphragm Method

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ARNOLD A. ALBRIGHT, *Colonel, MC, USA*
JOSEPH A. BUDETTE, *Lieutenant Colonel, MC, USA*

THIS case report illustrates the use of a free skin graft to reconstruct the lumen of the trachea. Our technic is a modification of the established method. To the best of our knowledge, this is the first case in which this altered procedure has been used in reconstruction of the lumen of the trachea. It permitted the successful repair of a low-lying stricture.

CASE REPORT

The patient was a 25-year-old man who had received multiple shell-fragment wounds to the body and neck. In 1946 when the patient was first seen by one of us, he had a tracheotomy tube in place and the adjacent soft tissue was extensively destroyed and replaced by scar tissue. The patient was unable to speak or pass air through the proximal end of the trachea. Laryngoscopy and roentgenograms revealed a complete cicatricial obstruction above the tracheotomy orifice in the area of the second, third, and fourth tracheal rings. This involved area measured about 1.5 cm. in vertical height (fig. 1, a and b).

On 19 August 1947 surgical repair was performed under cervical block anesthesia. A transverse incision was made about 1 cm. above the tracheotomy opening. The upper edge of the incision was undermined and retracted and the lower edge was undermined up to the tracheotomy fistula without entering its lumen. The trachea was entered by vertical incision, and the dense scar was excised from above downward. All cicatrix was removed except a thin layer just above the tracheotomy opening. The freshly formed proximal area was then skin grafted (fig. 1c). The stent-supported graft was transfixed by through-and-through tantalum wires which were passed laterally through muscles, subcutaneous tissue, and skin and were tied externally after closure of the skin edges. During the early morning hours of the fifth postoperative day, the tracheotomy tube became completely obstructed. Because the patient became deeply cyanotic and the surgical officer of the

From Percy Jones Army Hospital, Battle Creek, Mich. (now inactivated). Col. Soderberg is now assigned to Brooke Army Hospital, Fort Sam Houston, Tex.

day could not get to the patient soon enough, the nurse in charge removed the tracheotomy tube and freely aspirated through the tracheal opening. The patient's cyanosis cleared. A clean tracheotomy tube was inserted and the subsequent postoperative course was uneventful. Ordinarily, however, secretions and blood clotting in the tracheal tube would not be troublesome if the in-

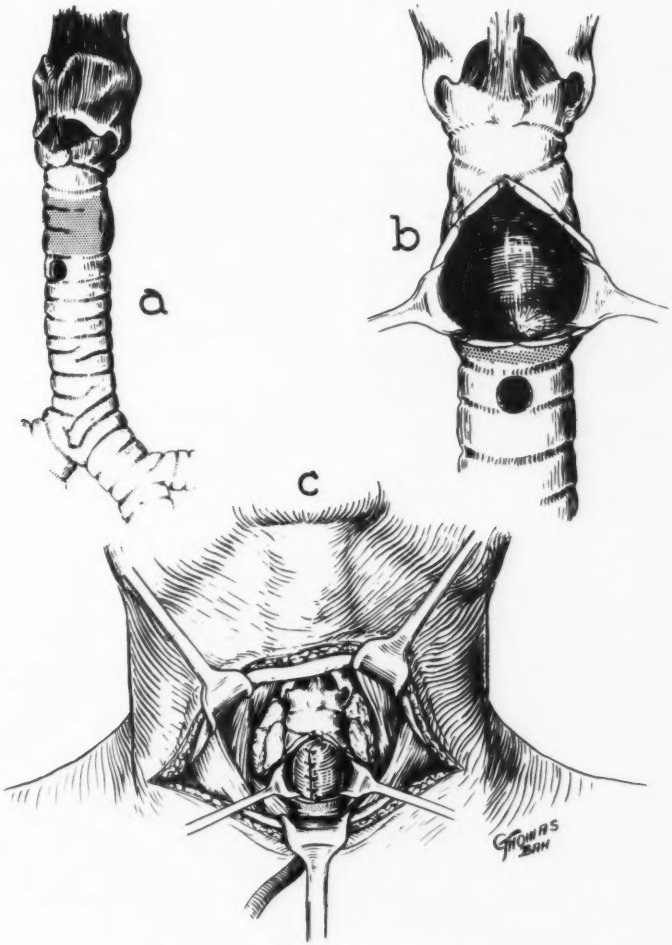

Figure 1. Complete obstruction of trachea by scar tissue above the tracheotomy orifice. (a) The location of the scar defect (shaded area). (b) The cicatricial diaphragm located just above the tracheotomy aperture. (c) Stent, covered with skin and placed in the trachea, conforms to the dimensions created by surgical excision of the scar.

ner tube were removed every hour or two and cleaned. On the tenth postoperative day the stent was removed through a bronchoscope. The successful growth of the graft reconstructed the lumen. The fibrous diaphragm above the tracheotomy opening was

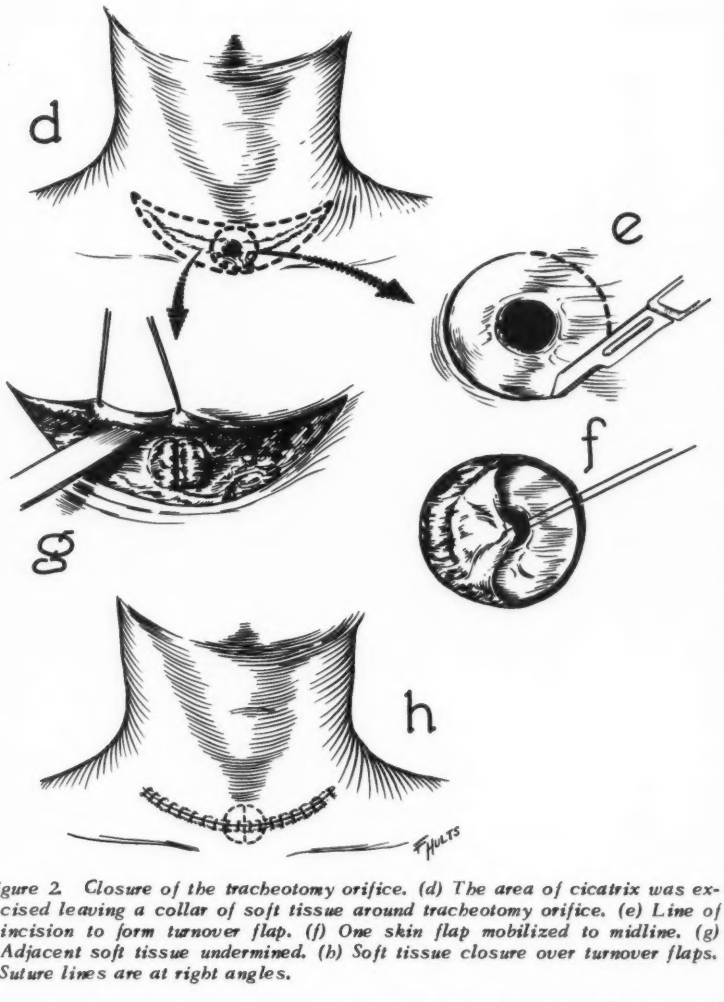

Figure 2. Closure of the tracheotomy orifice. (d) The area of cicatrix was excised leaving a collar of soft tissue around tracheotomy orifice. (e) Line of incision to form turnover flap. (f) One skin flap mobilized to midline. (g) Adjacent soft tissue undermined. (h) Soft tissue closure over turnover flaps. Suture lines are at right angles.

excised by loop cautery through the tracheotomy orifice on 15 October 1948. As soon as the lumen was open for clear air passage, the patient could speak.

Subsequently the tracheotomy orifice was closed by using two small, adjacent turnover flaps and superimposed adjacent soft tissue closure (fig. 2). Skin flap rotation was not required because the peripheral cicatrix had sufficiently softened.

A recent follow-up five years after the repair was completed indicates the patient to be living and well, performing normal activities.

DISCUSSION

Arbuckle[1] was the first surgeon to use skin grafts within the larynx for treatment of laryngostenosis. There is further discussion of skin grafts used this way by Erich,[2] Figi,[3] Foster,[4] Negus,[5] and Le Jeune and Owens.[6] The technic described by Erich for the repairs of extensive cicatricial stenosis of the larynx or upper part of the trachea has been accepted as a standard method of repair.

Ordinarily each patient with scar obstruction within the lumen of the larynx or trachea is considered first on the basis of its cause; second, its location and extent; and third, its relation to the location of the tracheotomy opening.

The cause is significant if the stricture had resulted from a specific granuloma such as syphilis, tuberculosis, blastomycosis, or neoplastic growth. The severest obstructive stricture observed usually results from trauma which might be a war wound or irradiation with resulting perichondritis.

Laryngoscopy is used to determine the location and extent of the cicatricial stenosis. Visualization of the lower part of the stricture through a tracheotomy opening is helpful. Lateral roentgenograms may be of some assistance to outline the extent of the lesion.

When the tracheotomy opening is situated adjacent to the stricture, a secondary tracheotomy is indicated well below the stenosis. Ordinarily, for a successful operation, the new tracheotomy opening should be located about 2 cm. below the obstruction. Subsequent to skin grafting, acrylic distenders which should be left in place about six months are used to overcome contraction.

In the patient presented, first consideration was given to an operation which would follow the previously designed technics. The low-lying tracheotomy orifice, however, made this impractical. The tracheotomy tube was not passed through a stent-supported skin graft because we believed that, should it become necessary to remove the tube as a postoperative emergency measure, considerable difficulty might be encountered in ob-

taining a free airway due to the presence of the stent. The cicatricial diaphragm procedure eliminated the necessity of this latter method.

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Centennial of Von Behring

Emil von Behring, "one of the greatest benefactors of humanity," was the son of a schoolmaster, who had 11 other children. He was born at Hansdorf, Deutsch-Eylau, West Prussia, on March 15, 1854, the day following the birth of Paul Ehrlich. He took his doctor's degree at the University of Berlin in 1878 and passed the State examination in 1880. He began his career as a military surgeon, serving in the Army Medical Corps, first at Posen, then in 1887 at Bonn, as staff surgeon, and lastly in the same rank in 1888 at the Army Medical College, Berlin. His first published paper (1887) dealt with iodoform as an antiseptic.

While still an army surgeon Behring was impressed by the discoveries in bacteriology which were revealing the cause of a number of diseases, and especially by the great work of his compatriot Robert Koch. In the early 'eighties, therefore, he began a series of investigations which were the precursor of his main lifework. Bacteriologists had noted already that white rats were immune to anthrax, while wild rats were susceptible. Behring took the fresh serum of white rats and tested it on anthrax bacilli *in vitro*. In a short time the bacilli were killed. Nuttall had made similar observations on the bactericidal powers of the fresh sera of man and of several animals, and his observations, together with Behring's findings, led to the humoral theory of defence against the invasion of germs into the animal body.

—SIR ARTHUR S. MacNALTY, M. D.
in *British Medical Journal*, p. 668,
Mar. 20, 1954

Bilateral Congenital Absence of the Serratus Anterior

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JAY F. TUTTLE, *Lieutenant Colonel, MC, USA*

CONGENITAL absence of important skeletal muscles is uncommon. Although any muscle may be absent, those of the shoulder, neck, and upper trunk, particularly the pectoralis, are most frequently missing. Ford[1] stated that these abnormalities are primary nonprogressive defects of the muscular system and unilateral in most instances. He reported 14 cases; one pectoral muscle was partially or completely absent in seven and the right trapezius was missing in one. Bing[2] in a survey of the literature, reported 102 cases of defects of the pectoralis muscles, 18 of the trapezius, and 14 of the serratus anterior muscles. Because of its comparative rarity we are reporting a case in which the serratus anterior muscle was absent bilaterally.

CASE REPORT

A 20-year-old soldier was admitted to the hospital for a neurologic examination because he was unable to do push-ups in physical training. He had winging of both scapulas; the serratus anterior muscles were absent as well as the lower portion of the sternal segment of the left pectoralis major (fig. 1). He was otherwise well developed with no evidence of other abnormalities, and the neurologic examination was negative. He was able to pull his shoulders forward to an abnormal degree, but could not raise his arms 90 degrees above his shoulders or do push-ups. Pushing against resistance increased the winging of the scapulas (fig. 2). He had no difficulty in performing such routine acts as dressing, writing, eating, and making his bed.

The patient's mother and younger brother also had winged scapulas. He had been active as a boy and participated in sports such as baseball and swimming, although he always felt "tight" across the shoulders and had been unable to exercise on parallel bars because his shoulders "popped out." He had worked as a postal clerk, often lifting heavy packages. It was not until he was required to take daily physical exercises in the service that

From U. S. Army Hospital, Nürnberg, Germany.

his disability was revealed. There was no history of acute neuromuscular disease such as poliomyelitis.

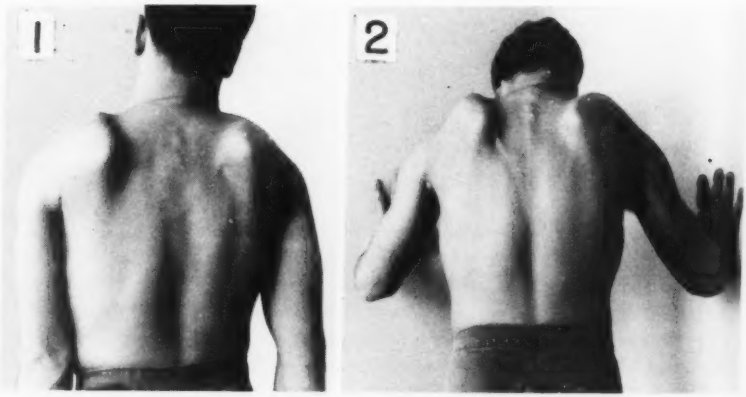

Figure 1. Winging of scapulas due to absence of serratus anterior muscles. Figure 2. Pronounced winging of scapulas when patient pushed against resistance.

Because of the patient's previous good adjustment no remedial therapy was indicated and he was returned to duty with a lower profile.

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Primary Tumors of the Rib

Primary tumors of the rib, though uncommon as compared with similar tumors arising in other bony structures of the body, are not so rare as has been supposed. Such new growths are recognized more frequently today than in the past because of the improved diagnostic methods and the more complete knowledge on the part of the clinician, radiologist, surgeon, and pathologist of the nature of these lesions. This greater familiarity with these tumors has led to the erroneous impression that the incidence of rib tumors is rising. That this is not the case becomes obvious from a study of the cases reported in the world literature for the last half century. Such studies also show that all types of primary neoplasms involving bone and cartilage, in other parts of the skeleton, may also be encountered in the ribs.

—LEW A. HOCHBERG, M. D.
in *A. M. A. Archives of Surgery*, p. 566, Oct. 1953

Psychologic Factors in Angioneurotic Edema of the Pharynx

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CHARLES W. SOCARIDES, *Lieutenant (MC) USNR*

SINCE the "fugitive inflammation" mentioned in 1843 by Graves[1] was described by Quincke[2] in 1882 as angioneurotic edema, the presence of psychologic disturbance in patients suffering from this condition has been observed. Despite this auspicious start in the psychologic understanding of angioneurosis, or neurosis affecting the blood vessels, few psychodynamically oriented case reports have been made.

The psychiatric investigation of skin conditions have led to the following conclusions which have been verified by various investigators and are now generally accepted: (1) The skin is an organ for the expression of emotion; *e. g.*, blushing, blanching. (2) As the covering for the body, the skin can become the screen on which exhibitionistic conflicts are expressed. (3) Because of its sensory function, the skin may be used in the rudimentary expression of pain and pleasure. These sensations may include pain-dependent sexual pleasure (masochism), orgastic (sexual) pleasure, and painful sensations of a nonerotic nature (*e. g.*, sensations occurring as due punishment for unconscious feelings of guilt). (4) As the skin has a blood supply and an autonomic innervation, the emotions of fear and rage and derivative emotions influence its nourishment and health. (5) Indication of a relationship between fluid secretion of the skin and emotional disturbance has been illustrated by the correlation of fluid secretion with weeping noted by Kepecs and associates.[3]

FORMS OF ANGIONEUROTIC EDEMA

Angioneurotic edema is characterized by temporary, well-defined, edematous swelling of the skin or mucous membrane; occasionally of the viscera (glottis or gastrointestinal tract or, rarely, the brain). The lesions themselves may persist from hours to days and be accompanied by burning and itching, or be without sensory phenomena. Modern medical opinion[4] is that there are two forms. The first is nonhereditary and relatively benign. It is usually due primarily to food allergy or is associated with urti-

From U. S. Naval Training Center, Bainbridge, Md.

caria, focal infection, or endocrine disturbances. In many cases, however, the causes are undetermined. It is evenly distributed between sexes and frequently has an onset at puberty. The second form, the apparently hereditary type, appears to have a more serious prognosis because the patient may develop a fatal edema of the glottis. In some cases a food allergy has been demonstrated. This form, according to Mackenzie,[4] may be transmitted without sex linkage through several generations, both by affected and unaffected individuals but transmission does not appear to be in accord with the theoretic expectations of a Mendelian dominant.

The mechanism involved has been compared to that occurring in urticaria. In urticaria, however, the superficial vessels of the skin are involved; in angioneurotic edema, the deeper vessels. A vasodilator substance, probably histamine, produces the vasodilation and transudation.

Visceral involvement, usually of the glottis, occurs only rarely in the nonhereditary form. According to Bulloch,[5] who published an extensive report in 1909, this alarming condition caused death in 21.1 percent of 170 patients. It would appear, however, that the criteria for the division into hereditary and nonhereditary forms are inconclusive. They seem to be based on whether or not recovery occurs within several years. Kallman[6] believes that the balance of available data favors the theory that angioneurotic edema is distinct from the common forms of allergy inherited as a simple dominant, and that genetic predisposition is dominant in a very irregular manner, *i. e.*, transmission by a pair of alleles, Hh, of which h determines the allergic condition. The case herein described, although involving the throat and larynx and occurring in both mother and daughter, need not be hereditary in type. An alternate psychodynamic explanation is given.

Epinephrine and ephedrine may alleviate attacks, but attempts to remove allergens, commonly considered to be foods, usually have been unsuccessful. Antihistaminic drugs have been proved more efficacious if taken early in the attack. A severe edema of the larynx may constitute an acute medical emergency and necessitate tracheotomy.

CASE REPORT

The patient, a 30-year-old enlisted woman, was constantly harassed and frightened in childhood by her half sister, who was two and a half years older. She was cared for by a housekeeper during most of her childhood because her parents were divorced when she was 15 months old, and her mother remarried when she was five years old. Within a year of her mother's remarriage, a

stepbrother was born of whom she has always been very resentful. Two more siblings were born, one when the patient was nine years old and the other when she was 13 years old. A stepsister developed poliomyelitis at the age of 14, and as she grew older the patient and she became further apart. In 1946, when the patient was 22 years old, her mother, age 51, died suddenly of what the patient believed was an attack of angioneurotic edema. The mother had had this condition as long as the patient can remember. One evening while doing some shopping she became "upset." The next morning she awoke with her face swollen, peered at herself in the mirror, suddenly could not catch her breath, and died. The patient knows little of her father. At the age of 14 she was severely ill and placed in an oxygen tent. Her father fled upon seeing her coughing desperately and apparently dying. She states that she has "no feeling for him whatsoever" and is not "upset" by his behavior toward her.

In her early childhood she has a screen memory of forced feeding by her mother. Her mother would "clamp her hand over my throat, and I felt like choking to death." She is vaguely aware of a constant feeling of loneliness, chronic fears of the dark, and social discomfort. She also felt unwanted during her childhood years.

Allergic conditions have been notably absent in all members of the family except the mother.

The patient's complaints first appeared in 1936 at the age of 14. At that time she had been in the hospital for nine weeks and had undergone a mastoidectomy. Subsequently, she developed pneumonia with complications. A rib resection on the right side was done for empyema. Nine days following operation her hands and left forearm suddenly began to swell, and "it kept going down into my throat." This swelling persisted for a few days and then disappeared. There were no attacks from the ages of 14 to 19, when both hands and feet were suddenly affected. At this time the attacks began to have a characteristic course. They came on slowly and disappeared within four or five days. After the swelling began its insidious course, there was a rapid increase to the maximum point. At 19 while away from home the patient developed "influenza," and a physician remarked that she had "stomach ulcers" too, even though she complained only mildly of stomach pain. She became frightened by this pronouncement, developed an attack, and went home immediately.

Except for her first attack in 1936, there were no choking spells and involvement of the neck until 1945. In February 1945, in the excitement of being accepted for enlistment for overseas service, she "got all excited, and woke up one morning with a very

full feeling in my throat." Laryngeal swelling and difficulties in breathing were controlled by epinephrine. During 15 months in Hawaii, she had two separate attacks, both localized in the left hand.

The patient had two episodes in 1950. After transfer to her present duty station in 1951, she developed attacks about every two months with swollen hands and arms and involvement of her throat. On one occasion she became acutely ill with edema of the glottis. The medical officer, unfortunately not perceiving that the patient's irritability was a defense against strong dependency needs, reacted to it with counterirritation. Medication failed to alleviate the attack, and a tracheotomy tube was placed beside the patient's bed. Because her anxiety mounted, psychiatric consultation was requested and the patient was almost immediately relieved of her symptoms by one of us, through reassurance and patient listening to her life story. This was the beginning of her insight into the emotional nature of her illness. She believes that her attacks in 1951 were probably due to a "conflict of personalities" with her superiors and other associates. After this initial psychotherapy and subsequent change of duty, her attacks disappeared completely for one and a half years.

The patient's most recent attacks have been mild and usually occur in a setting of suppressed or repressed rage. She stated, "I feel a gripping in my throat, and I can tell it is just my anger building up." On one occasion when she was questioned by the police about an automobile accident in which her car was involved, "I became tightened up in my throat and angry inside." Her symptoms may not appear immediately upon becoming "upset," but only after the pressure of the situation has disappeared, and upon reliving the incident in fantasy. The over-all severity of attacks has decreased since the beginning of treatment by the psychiatrist. Severe edema of the throat has not recently occurred, and the patient is greatly encouraged by her progress. In quiescent periods she does well in her job as clerk-typist.

Skin tests at various intervals in the past have revealed questionable positive reactions to celery, apple, and house dust. Careful dietary measures and investigation, with the omission of certain foods, have had no effect on the frequency of attacks.

DISCUSSION

With progressive adaptive failure throughout life, both in the social and sexual areas, there were increasing tendencies for this patient's attacks to become worse and to occur more frequently. This course, in spite of what allergic factors may exist, has been impeded by brief psychotherapy. The attacks themselves are unconscious moves of repair against her fears of

abandonment and excessive feelings of rage. Alexander[7] has remarked that these persons find it difficult to cry. There is an almost complete denial of welfare emotions, *e. g.*, love, joy, and tender receptive feelings. Lorand[8] reported a case of angioneurotic edema in which dependent desires were a crucial issue in the development of this condition. There are certain similarities in his report with this one.

In a recent study of 35 patients with urticaria, Wittkower[9] cited a complaint shared by sufferers in both groups. Two thirds of his patients spontaneously stated that they missed parental, especially maternal, affection as children, even though this belief may have been unfounded. It is apparent, in our opinion, that such a patient's excessive need for the parent may be engendered because of severe anxiety experienced at an early age from a cause totally unrelated to maternal loss or deprivation. In a large number of his patients (19 out of 25) the onset of urticaria was preceded by disturbing events entailing anticipated or actual withdrawal of love.

SUMMARY

A description of the role of psychologic factors in the production of attacks of angioneurotic edema emphasizes that throat involvement with the attendant danger of asphyxiation constitutes a psychiatric as well as a medical emergency.

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Aneurysm of the Temporal Artery Due to Trauma

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WALEED G. MALOOF, *Captain, USAF (MC)*

ANEURYSM of the temporal artery is rare and mentioned only infrequently. Winslow and Edwards[1,2] in 1934 extensively reviewed the literature and reported 108 cases, of which 15 were arteriovenous. Seventy-nine were due to trauma, either penetrating or blunt. Since then occasional reports have appeared.[3-6] Its predominant occurrence in males is because of their greater occupational exposure to trauma. When bloodletting by temporal arteriotomy was common during the nineteenth century in the treatment of cerebral congestion, meningitis, and apoplexy, aneurysms were more frequent. They also occasionally

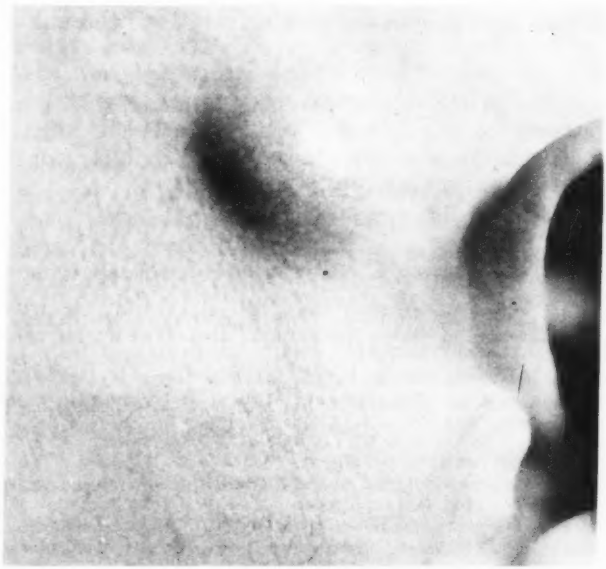

Figure 1. Preoperative appearance of temporal aneurysm.

From U. S. Air Force Hospital, Pepperrell Air Force Base, St. John's, Newfoundland.

followed rapier slashes inflicted in students' duels at German universities.

The tumor varies from pea to orange size, but is generally no larger than a walnut. Because of progressive enlargement, pulsations and throbbing, increased susceptibility to injury due to superficial location, and a certain degree of disfigurement, treatment of the aneurysm is indicated. Perrett[4] reported a traumatic arteriovenous aneurysm producing noises in the ear which responded to proximal and distal ligation of the artery and vein.

The differential diagnosis includes sebacious cyst, pulsating hematoma, and abscess. However, the characteristics of pulsation (which disappears after proximal compression), the history of trauma, and the site of the lesion lead to the diagnosis.

Various procedures, including proximal suturing of the artery, proximal and distal ligation, and ligation of the external carotid artery, have been attempted to correct this condition. Prolonged digital compression and injection of sclerotics were used before

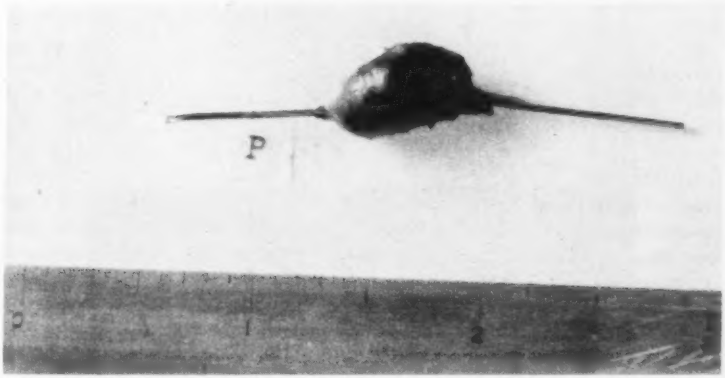

Figure 2. Surgical specimen. (P) The proximal portion of the artery.

the turn of the century. Because there is a rich anastomotic network of the branches of the external carotid artery, excision of aneurysm after proximal and distal ligation of the temporal artery will not result in any circulatory embarrassment to that portion of the scalp, and is the most effective procedure.

CASE REPORT

The patient was a 31-year-old man who struck his left temple against a steering wheel when in an automobile accident six weeks prior to admission. Three days later a mass appeared anterior to his left ear just above the hairline. This slowly increased in size until admission (fig. 1).

Physical examination was negative except for a pulsating and slightly movable soft tissue mass over the left temple, 4 cm. in diameter, and not attached to the skin. Its pulsation was synchronous with the heart beat. Proximal compression of the superficial temporal artery caused the pulsation to cease, but the mass, although smaller, persisted. No bruit could be heard over the mass. Urinalysis and blood count were normal and a serological test for syphilis was negative. Roentgenograms of the skull revealed no erosion of the bone. In view of the noticeable enlargement and the superficial location, surgery was advised.

On 22 October 1953, under local anesthesia, the aneurysm was exposed through a small transverse suprazygomatic incision within the hairline, and excised. The proximal and distal branches of the superficial temporal artery were ligated. The terminal

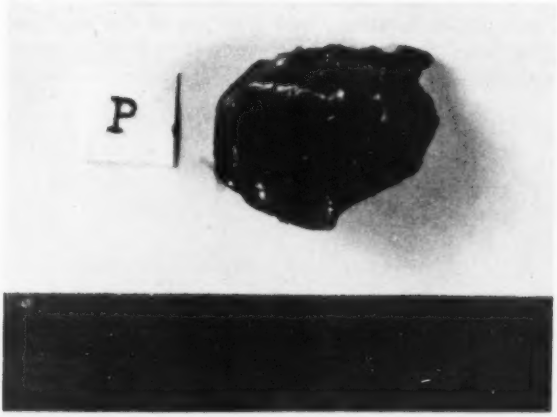

Figure 3. Specimen opened. The normal vessel wall is at the upper margin. Note the clot filling the sac below.

branches of the artery, the frontal and parietal, which originated just distal to the aneurysm, were ligated separately. The pathology report was "temporal artery, traumatic aneurysm" (figs. 2 and 3). The postoperative course was uneventful and the patient was returned to duty two days after operation. He was seen one month later, and the anatomic and cosmetic results were excellent.

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As Others See Us

Another error we as physicians have at times been guilty of * * * might best be described by the following situation: A husky young recruit in a basic training unit appears on "sick call" with a respiratory infection. He is seen by an eager young medical officer just out of his internship and anxious not to forget how to use his stethoscope. The officer listens to his young patient's chest with an air of clinical enthusiasm and picks up a heart murmur. * * * He makes some casual mention of it, in all innocence, and perhaps thinks little more about it until perhaps the very next day, when a worried, anxious looking "GI," the same husky recruit, again appears on "sick call," * * *. His "cold" is improved but this time he is really concerned about whether or not he has heart disease. The young medical officer again listens to his patient's chest and heart. Today perhaps the murmur seems a bit louder and a bit more harsh. The young medical officer heard a murmur which he thought was interesting but little more. But now he has a young soldier on his hands who wants to know about his heart. Like all young medical officers, he sees no reason whatsoever to assume the responsibility of reaching a decision concerning the significance of this murmur and so the "buck-passing" begins. He refers his patient to the cardiac clinic at the post hospital so a specialist may evaluate the situation. Now it is important to remember that the army cardiologist frequently has an entirely different attitude toward his military patient than he would have toward a private patient. * * * He sees the young soldier, examines him, orders an electrocardiogram, perhaps fluoroscopes the patient, orders some chest roentgenograms and about anything else that pops in his mind. * * * After all this let us assume that a correct diagnosis of an insignificant functional murmur is made and the young soldier is told that he has nothing of significance wrong with his heart and he is returned to duty. Somehow, after all this attention has been directed to his heart, our young recruit finds it a bit difficult to swallow the fact that there is nothing wrong with it. You see, a seed is planted in good soil, it is fertilized and well attended, it grows and we have another cardiac neurotic well on the way.

—PAUL SIMPSON, M. D.
in *J. Kentucky M. Assn.*
p. 474, Nov. 1953

Relief of Severe Pruritus Ani by Presacral Neurectomy

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GEORGE M. MALKIEWICZ, *First Lieutenant, USAF (MC)*

IN many severe cases of pruritus ani no definite causative agent can be identified, and current treatment leaves much to be desired. It is not within the scope of this article to discuss pruritus ani comprehensively; but to present a single case of severe, intractable pruritus ani in which the patient experienced immediate and complete relief after presacral neurectomy. The operation was performed only after the patient was given a reasonably complete clinical and laboratory study to discover a causative agent, and after it had been demonstrated that he obtained indisputable relief from a presacral block with piperocaine hydrochloride (metycaine hydrochloride).

We have found no record of presacral neurectomy previously having been performed for pruritus ani.

CASE REPORT

A 25-year-old man, admitted to this hospital on 26 January 1954, complained chiefly of perianal itching of three years' duration. His distress had been more severe during the past year and he had obtained no relief from a wide variety of local applications. He had not received roentgen therapy. The past history and the family history were noncontributory. He had never been outside the United States.

On examination the perianal skin was thickened, whitish, and thrown into folds and sulci. Numerous areas had been denuded by scratching. No enlarged papillae, abnormal crypts, or external or internal hemorrhoids were noted. Proctocolonoscopy for a distance of 20 centimeters revealed no abnormal findings. It was our impression that the patient was emotionally stable.

Indicated laboratory studies revealed no significant findings.

A block of the patient's lumbar sympathetic nerves bilaterally with piperocaine hydrochloride had no effect on his itching, but one of his presacral nerves according to the technic of Flothow,[1] with piperocaine hydrochloride, resulted in complete relief of

From U. S. Air Force Hosiptal, Scott Air Force Base, Ill.

the patient's itching for about six hours. A biopsy of the perianal skin, less than four millimeters square, was taken under procaine hydrochloride anesthesia. This procedure had no effect on the patient's itching.

At operation, the presacral nerves were resected according to the technic of Adson and Masson,[2] and a second biopsy of the perianal skin was taken at the verge of the anal canal. Because the first skin biopsy did not affect the patient's itching and excision of a piece of perianal skin less than four millimeters square usually will not relieve severe pruritus ani, it was believed that the second skin biopsy would not confuse the results of the presacral neurectomy.

Microscopic examination of the excised portions of the perianal skin showed a prominent degree of acanthosis with a lesser amount of hyperkeratosis and parakeratosis. In some areas there was a coalescence of the rete cells. There was fibrosis in the papillary portions of the derma and a light to moderate diffuse infiltration of lymphocytes with fewer numbers of monocytes. In many instances the inflammatory cells were located perivascularly. There was dilatation of the lymphatics in the mid-part of the derma, and a light degree of fibrosis was noted throughout the entire corium. The tissue excised at the time of the presacral neurectomy showed numerous nerve fibers cut longitudinally and on cross section. They were surrounded by collagenous connective tissue varying in density, and large fields of adipose tissue.

The morning following operation a careful interview was conducted with the patient. Mention of his rectum was avoided in an effort to induce him to volunteer a statement concerning his itching. When he did not offer any comment, he was asked, "How is your rectum?" His reply was, "I don't feel anything there." He was then told that another biopsy of his perianal skin had been taken. He was surprised and repeated his former statement. At the time of writing, 10 days after operation, the patient has had no perianal itching.

DISCUSSION

A report of a single case of severe, intractable pruritus ani treated by presacral neurectomy seems justified, not only on the grounds that the patient experienced immediate and complete relief from his itching, but also because the operation is not being done currently in the treatment of this distressing condition. This report may enable other proctologists to perform the procedure in the critical manner that will establish its proper place, if any, in our armamentarium. Evaluation of the operation will require time. Buie[3] based his appraisal of his own large experience with pruritus ani on a two-year follow-up period, or longer.

The idea of performing presacral neurectomy occurred to one of us (C. S.) while reading a paper in the French literature (exact reference now lost) on the relationship of the sympathetic nervous system to itching sensation. The superficial similarity of the skin lesions of pruritus ani, often called a neurodermite, and those of sceleraderma was recalled. When the patient reported on here experienced indisputable relief from a block of his presacral nerves with piperocaine hydrochloride, it was decided, with the patient's full understanding of the nature of the procedure, to resect his presacral nerves. Because of the intensity of his distress and the failure of many conservative measures to relieve him, the patient did not hesitate to accept the operation; he merely asked how soon it could be done, a common reaction of patients with severe pruritus ani. The complete and immediate relief afforded by the operation resembled the dramatic relief that sympathectomy brings to patients with major causalgia. It is interesting, too, that the patient suffered no distress following the biopsy of his perianal skin distal to the anal canal, a procedure usually followed by considerable pain. The experience of the patient, who said he didn't know he had a rectum after presacral neurectomy for pruritus ani, is at least an interesting commentary on our knowledge of the autonomic nerve supply to the anus.

Presacral neurectomy is not a difficult operation. Like any major surgical procedure, it is not without hazard. To some it may seem a formidable procedure for the relief of itching, but not so to patients with severe pruritus ani. The operation should be attended by less morbidity than that resulting from sloughing of the perianal tissues which may follow the local injection of alcoholic solutions.

In the present case, blocking of the presacral nerves with piperocaine hydrochloride resulted in temporary but indisputable relief of the perianal itching. This procedure may prove to be a useful means of selecting patients for operation.

In reporting this case, we have no intention of suggesting that presacral neurectomy be performed upon patients with pruritus ani in whom a cause can be established that responds to more conservative measures.

ADDENDUM: One month after operation, when this patient was dismissed from our care, he was completely relieved of pruritus ani. A continued search of the literature, made after the operation reported here, revealed that presacral neurectomy has been performed on a small number of patients for pruritus vulvae by South American and European surgeons. The results have not been uniformly good, but the presence of pelvic pathology has been a confusing factor. A French gynecologist[4] performed presacral neurectomies on two men suffering from pruritus ani. Complete relief was obtained in both cases, the follow-up on one patient being three years, and on the other, three weeks.

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The First Hypodermic Syringe

One hundred years ago a French physician, Charles-Gabriel Pravaz (1791-1853), of Lyons, France, introduced into medical practice the use of the hypodermic syringe. The syringe was provided with an external nut working on a thread cut about the piston so that the contained liquid could be extruded drop by drop. Another novel item of this syringe was a slip joint, the needle being of steel and the hub of hard rubber.

Alexander Wood (1817-1884), of Edinburgh, was the first physician to use this hypodermic syringe for the administration of drugs. He injected morphine hydrochloride into patients with intractable neuralgias; in all of them a remarkable rapidity of the effect of the drug was demonstrated. Wood concluded correctly "that in all probability what is true in regard to narcotics would be found equally true in regard to other remedies. The Pravaz syringe affords a safe, easy, and almost painless method of parenteral therapy."

—SAMUEL J. ZAKON, M. D.
in *A. M. A. Archives of Dermatology and Syphilology*, p. 591, Nov. 1953

The Problem of Thromboembolism

What has long been badly needed is a reliable test for the presence of venous thrombosis or, better yet, incipient thrombosis. This field, of course, has not been entirely neglected, but unfortunately none of the multifarious tests which have been proposed and employed for determining the presence of venous thrombosis as well as for the prediction of its occurrence has proved satisfactory. Indeed, this aspect of the problem is as confusing as any, for as each test has been hopefully presented, usually on the basis of preliminary observations, other reports have soon followed to shatter the hopes with conflicting or refutatory evidence.

—MICHAEL D. DeBAKEY, M. D.
in *Surgery Gynecology and Obstetrics*, p. 17, Jan. 1954

GEN. SNYDER PROMOTED, NAMED TO SUCCEED GEN. LOVE AS CHIEF OF ARMY DENTAL CORPS

Major General Oscar P. Snyder, World War II Chief Dental Surgeon of the Southwest Pacific Theater, was sworn in on 12 April 1954 as Assistant Surgeon General of the Army and promoted from a brigadier general to the higher grade. On 30 April he succeeded Major General Walter D. Love as Chief of the Army Dental Corps and Chief of the Dental Division in the Office of the Surgeon General. General Love was retired after more than 37 years of military service.

Major General Oscar P. Snyder, right, is shown taking the oath of office as Assistant Surgeon General of the Army, administered by Major Davis E. Marchus, MSC, USA, in the presence of Major General Silas B. Hayes, left, Deputy Surgeon General, and Major General Walter D. Love, his predecessor as Chief of the Army Dental Corps.

General Snyder is a former vice-president of the American Dental Association, a member of Xi Psi Phi dental fraternity, and Omicron Kappa Upsilon, honorary dental fraternity, a fellow of the American College of Dentists, and consulting editor of the *Oral Surgery, Oral Medicine, and Oral Pathology.* In May 1951 he received the Alumni Award of Achievement from Ohio State University.

Advantages of the Keratometer in Refraction

BERNARD G. PLATT, *Lieutenant Commander (MSC) USN*

THE keratometer, or ophthalmometer, is a very important adjunct to the armamentarium of any refractionist. I have been using one for over five years, and in performing over 15,000 refractions have found its calculations very helpful in arriving at the final prescription.

The use of the keratometer is simple and can be mastered in a very short time. At the completion of the viewing of each eye, readings are made on the horizontal (left) drum and on the vertical (right) drum, and the difference between the two readings is the corneal astigmatism of that eye. The axis of the keratometer cylinder is read on another dial.

Keratometer findings are read as illustrated in the following:

Vertical (right) drum	42.75 D
Horizontal (left) drum	41.25 D
Difference (corneal astigmatism)	1.50 D WR (with-the-rule)

If the axis markers point to 90 and 180, the difference between the drum readings being 1.50 D and the most power being in the vertical meridian, the recording is 1.50 WR axis 90° (using plus cylinder).

The power of the corneal astigmatism will be modified by:

1. Javal's rule: In with-the-rule astigmatism, increase the keratometer finding by one fourth of its value, then deduct one-half diopter. In against-the-rule astigmatism, increase the keratometer finding by one fourth of its value, then add one-half diopter. This is an over-all rule to be used with caution, as it will not apply to every case.

2. The strength of the correcting spherical lens. The more plus sphere, expect less subjective cylinder than would be expected after Javal's rule is applied. The more minus sphere, expect more subjective cylinder than would be expected after Javal's rule is applied.

From U. S. Naval Dispensary, San Francisco, Calif.

The axis may be modified by the lenticular astigmatism; hence, the final axis of the correcting cylinder should not be expected to be the same as the keratometer axis.

Speaking in terms of plus cylinders, if the axis of the keratometer cylinder is at 180°, the correcting cylinder axis will be at or very close to 180°, but if the keratometer axis is at 165°, the final correcting axis will lie between 165° and 180°. The higher the correcting cylinder, the closer to the keratometer axis will be the final axis. If the keratometer axis is at 90°, the final cylinder will be at or very close to 90°.

When a keratometer is used, weak cylinders can be prescribed with more confidence, as illustrated by the following case in which the patient was hesitant in the various subjective tests in deciding between 1/4 D or 1/2 D cylinders:

Keratometer findings: O. D. 1.50 WR axis 90°

O. S. 1.50 WR axis 90°

Considering the keratometer findings, I would prefer the 1/2 D cylinder; but if the keratometer finding had been 0.50 D WR, I would prefer the 1/4 D cylinder. Determining the final axis is made much easier by considering the keratometer axis, especially when, because of a weak cylinder, the patient experiences difficulty in deciding.

There are many more aids that the refractionist gets from the keratometer. After a while he depends on this instrument as much as he does on the retinoscope.

SUMMARY

Use of the keratometer aids the refractionist in many ways. It helps in deciding whether or not a small cylinder should be prescribed, in immediately determining the presence of any sizable amount of astigmatism, and by revealing the presence of irregular astigmatism through the distortion of the mires reflected from the cornea. It gives the refractionist a preliminary idea of the patient's visual acuity; when a low amount of with-the-rule astigmatism is found in one eye and any amount of against-the-rule astigmatism is found in the other, it warns of a possible lower acuity in the latter eye. Through its use a more accurate cylinder can be prescribed in aphakia, in which condition the patient usually experiences difficulty in deciding on the proper cylinder in the subjective tests. Finally, it helps in prescribing contact lenses. When the mold method is not used, the curvature of the cornea is obtained with the keratometer, which enables proper curvature to be ground into the contact lens.

Inadequate Arch Support in Shoes

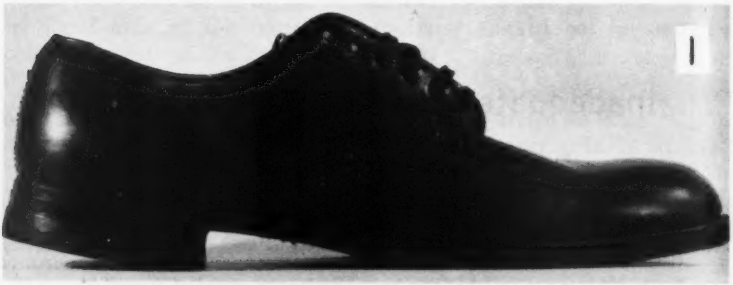
ROBERT KENDRICK, *Orthopedic Technician*
GEORGE H. CHAMBERS, *Major, USAF (MC)*

PATIENTS with foot and leg complaints are common in all orthopedic clinics, civilian or military. Acute and chronic foot strain with tenderness of the intrinsic muscles of the foot, tenderness of the plantar calcaneonavicular (spring) ligament, and frequently with tenderness of the bellies of the tibial and peroneal muscles are perhaps more common in military personnel, particularly at indoctrination or training centers. The trainee is of necessity subjected to long hours of standing and walking. He is given issue shoes of the brogan and low-quarter types with reasonable care as to proper fit. Many are observed with foot complaints from the beginning of their training. Six weeks to three months later another group is seen with findings of acute and chronic foot strain.

Examination frequently reveals the shoes to be at fault because the shank, having given way, allows the arch of the shoe to sag, creating a "rocker-bottom" effect (fig. 1). This is more common in the long, narrow and in the low-quarter shoe than in the brogan. The issue shoe, both brogan and low-quarter, is fitted with a spring steel shank of metal, five-eighths by four and one half inches. In the low-quarter shoe a fiber backing is used for additional stiffness, whereas in the brogan stiffness is supplied by the extra thickness of the sole. In the heavier person, and particularly one with a long, narrow foot, this support is inadequate and allows the shoe to sag in the center and to raise on the ends. Frequently the patient will state that it feels as if he is walking over a ridge in his shoe.

Transverse bars in the metatarsal region is the simplest means for correction of these shoes but with repeated application of bars the sole may break and an undesirable hump may appear inside of the shoe. The insertion of combination supports within the shoe itself is helpful but does not stop the deformation of the shoe. Replacement of the metal shank by a spring steel shank of heavier steel hammered into proper contour before insertion (fig. 2) has proved entirely satisfactory. Such shanks were purchased locally in dozen lots at a cost of 12 cents each from a

From U. S. Air Force Hospital, Sheppard Air Force Base, Tex.



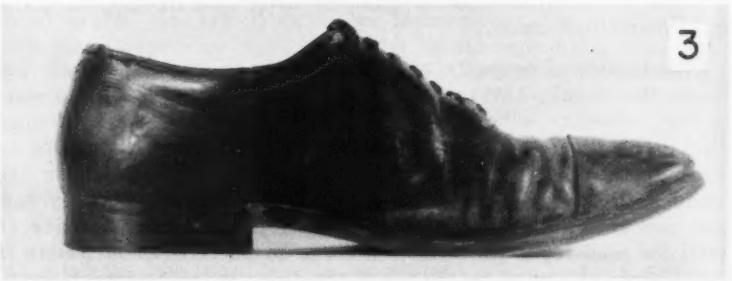


Figure 1. A low-quarter shoe with sagging arch. Figure 2. Steel arch shanks. (A) Heavier gage steel hammered into proper contour. (B) Shank from issue shoe. Figure 3. A low-quarter shoe six months after replacement of shank, showing well-formed arch and heel flat.

shoe supply company. Shoes so repaired have been used for six to eight months, until virtually worn out, with continued maintenance of the shoe form (fig. 3) and no return of arch or heel symptoms.

REAR ADM. HOGAN AND CAPT. JACKSON NAMED TO HIGH POSTS IN NAVY BUMED

Rear Admiral Bartholomew W. Hogan has succeeded Rear Admiral Clarence J. Brown as Deputy Surgeon General of the Navy and Assistant Chief of the Bureau of Medicine and Surgery, and Captain Leona Jackson has been appointed the fourth Director of the Navy Nurse Corps. Admiral Hogan reported for his new assignment just prior to the departure for Paris last month of Rear Admiral Lamont Pugh, Surgeon General of the Navy, for the medical planning conference of senior medical representatives of the NATO nations.

Rear Admiral Lamont Pugh, right, is shown briefing his new assistants, Rear Admiral Bartholomew W. Hogan (MC) USN and Captain Leona Jackson (NC) USN.

Admiral Brown and Captain Winnie Gibson (NC) USN, Captain Jackson's predecessor, were both retired from the service on 1 May 1954.

Admiral Hogan, a former commanding officer of the U. S. Naval Medical School and of the U. S. Naval Hospital, Bethesda, Md., came to Washington from an assignment as Pacific Fleet Surgeon on the Staff of the Commander-in-Chief, U. S. Pacific Fleet. Captain Jackson, who became a prisoner of war when Guam fell to the Japanese in 1941, until recently was chief nurse at the U. S. Naval Hospital, Portsmouth, Va.

Modification of Dental Surveyor

GEORGE T. PERKINS, *Colonel, DC, USA*

THE electronic section of the dental department of this school has completed a modification of the Austenal surveyor which was first suggested by Lieutenant Colonel R. K. Ewart at Percy Jones Army Hospital in 1953.

This device has specific laboratory uses in the designing and fabrication of partial dentures, namely, to locate the crest of contour of abutment teeth, undercut area, convenience points, and the trimming of block-out areas. Figure 1 illustrates the dental surveyor as originally designed and the accessories required for its use. All accessories have tapered shafts and are secured on the long axis rod by wedging. Previously, the paralleling spindle had to be heated indirectly, which often resulted in burned fingers.

Figure 2 shows the improved modified surveyor in which objectionable features were eliminated. This was done by cutting off the tip of the paralleling rod and inserting a small heating element which is available on the commercial market. The element required about 0.015 of an inch grinding before it could be slipped into the end of the shaft, which was hollow and formed a convenient passageway for the alternating current cord to the control mechanism which is connected to the power outlet by the plug provided. The heat control is adjusted by the operator to obtain the desired temperature. A magnified view of the heating element and collet for holding the lead pencil is shown in figure 3.

The present modification provides: (1) controlled heating; (2) a collet and screw attachment, which eliminate the tapered shafts and makes possible the use of a standard lead pencil instead of the lead (backed by metal) supplied by the manufacturer which has a tendency to remove part of the abutment teeth unless extreme care is exercised; (3) a saving of time and greater accuracy; and (4) a means of using a harder block-out wax that will be unaffected by hydrocolloid duplication.

Two surveyors have been modified at a cost of $8.41 each. One is being used at the Central Dental Laboratory, Walter Reed Army Medical Central, and has proved highly satisfactory.

From Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C.

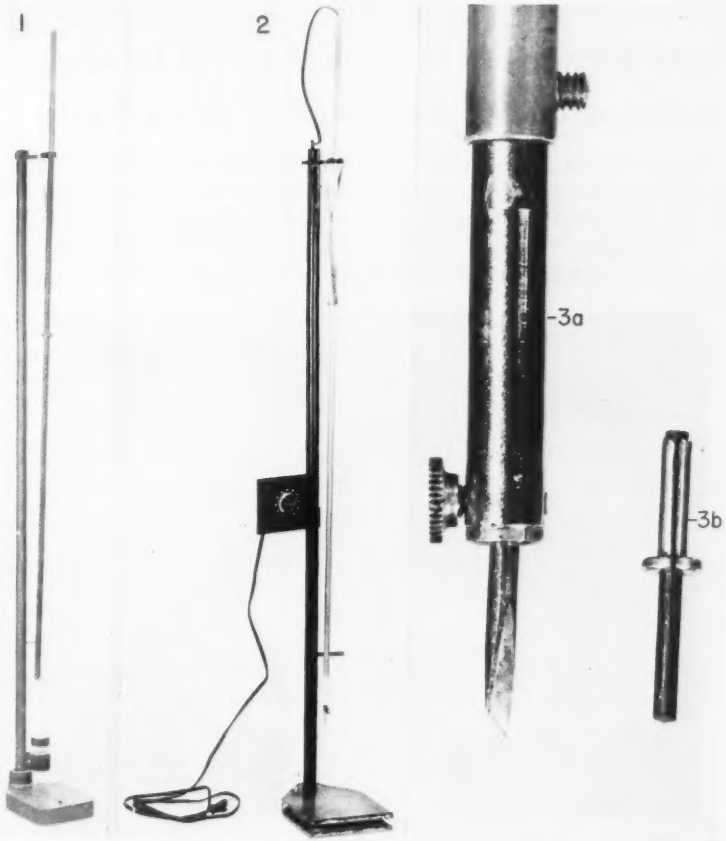


Figure 1. Surveyor before modification. Figure 2. Surveyor after modification with temperature (rheostat) control on vertical support. Figure 3. (a) Magnified view of heating element which was taken from a miniature soldering iron. (b) Collet which can hold a conventional lead pencil.

Dental caries, no doubt, exceeds in prevalence all other physical defects in children, and to date there appears to have been little advance made in arresting or preventing this disease. While we know the old saying that "a clean tooth does not decay" is not true, neither is the statement true that filthy or unhygienic teeth decay rapidly when they are so often found covered with food material for days at a time.

—E. N. BACH, D. D. S.
in *American Journal of Orthodontics*, p. 756, Oct. 1953

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FIRST WOMAN PHYSICIAN IN REGULAR ARMY MEDICAL CORPS IS PROMOTED TO CAPTAIN

Captain Fae M. Adams, MC, USA, who on 6 February 1953 became the first woman in history to be commissioned in the Medical Corps of the Regular Army, was promoted from a first lieutenant on 6 May 1954 in a ceremony at Walter Reed Army Hospital, Washington, D. C., where she is a resident physician in obstetrics and gynecology.

First Lieutenant Eileen B. McAvoy, MC, USA, center, congratulates Captain Fae M. Adams, MC, USA, following announcement of her promotion by Major General Leonard D. Heaton, right, commanding general of Walter Reed Army Medical Center.

A 1951 graduate of Women's Medical College in Philadelphia, Captain Adams' military service began when she enlisted in the Women's Army Corps in October 1943. She was commissioned a second lieutenant in the Women's Medical Specialist Corps on 10 July 1945, and served 14 months in Okinawa before being separated from the service to enter medical school.

First Lieutenant Eileen B. McAvoy, MC, USA, the second woman to be commissioned in the Medical Corps of the Regular Army, is also stationed at Walter Reed Army Hospital where she is a resident in internal medicine. A former Army Nurse Corps officer, she was graduated from Baylor University College of Medicine in 1952 and commissioned in the regular service on 29 June 1953.

OFFICIAL DECORATIONS

LEGION OF MERIT

John K. Davis, *Col., MC, USA*
Archibald M. Ecklund, *Capt. (MC) USN*
Eugene R. Hering, *Capt. (MC) USN**
Charles L. Leedham, *Col, MC, USA*
C. M. Lessenden, Jr., *Lt. Comdr. (MC) USN**
Henry Litvin, *Lt. (jg) (MC) USNR*
Gerald A. Martin, *Lt. (MC) USN*
William S. Ogle, *Lt. (MC) USNR*
Fred W. Seymour, *Col., MC, USA*
Henry J. Tvrdy, *Col., MC, USAF*

BRONZE STAR MEDAL

James K. Arima, *Capt., MSC, USA*
Frank H. Austin, *Lt. (jg) (MC) USN*
George H. Bartlett, *Maj., MSC, USA*
Alan A. Basinger, *Lt. (jg) (MC) USNR*
Lawrence E. Bazzell, *Capt., DC, USA*
Herman E. Beehrman, *Capt., MSC, USA*
George M. Bell, *Comdr. (MC) USN*
Richard E. Bentley, *Capt., MSC, USA*
Joseph A. Boardman, *First Lt., MSC, USA*
Robert D. Boone, *First Lt., MC, USA*
John A. Booth, *Lt. Col., USAF (MC)*
William A. Boyson, *Capt., MC, USA*
John S. Bradshaw, *First Lt., MC, USA*
Edward Bremmer, *Second Lt., MSC, USA*
Albert B. Britton, Jr., *First Lt., MC, USA*
Joseph G. Brown, *Capt., MC, USA*
Robert B. Brown, *Capt. (MC) USN*
Robert D. Buchanan, *Maj., DC, USA*
Ewell R. Burkhalter, *First Lt., MC, USA*
Stanley E. Butler, *Capt., MSC, USA*
William E. Cape, *First Lt., MC, USA*
George F. Catleff, Jr., *Lt. (MC) USNR*
Robert E. Chambers, *First Lt., MC, USA*
Eugene H. Chapman, *Capt., MC, USA*
Eddie L. Clark, *Capt., MC, USA*
Ambrose H. Clement, *First Lt., MC, USA*
Ruth M. Cohen, *Lt. (NC) USN*
David G. Covell, *First Lt., USAF (MC)*
Kenneth J. Cox, *Lt. (jg) (MC) USNR*
William C. Davis, *Lt. (jg) (MC) USNR*
Frank DeBellis, *First Lt., MSC, USA*
John R. DeFarges, *First Lt., MSC, USA*
William A. DeFries, *Lt. Col., MC, USA*
Joseph A. Diorio, *First Lt., MC, USA*
William F. Duncan, *Capt., DC, USA*
Phillip R. Dunn, *First Lt., MSC, USA*
Charles H. Eaton, *Comdr. (MC) USN*
Jonathan J. Eckhart, *First Lt., MC, USA*
Charles W. Fain, Jr., *Lt. (jg) (DC) USNR*
William J. Farrell, *Lt. (jg) (MC) USNR*
Vergil H. Ferm, *First Lt., MC, USA*
Domenic S. Fiorentino, *Capt., MC, USA*
Lydon B. Fitch, Jr., *Lt. (jg) (MC) USNR*
Martin B. Fliegel, *Capt., MC, USA*
Winslow G. Fox, *First Lt., MC, USA*
Stanley H. French, *Maj., MSC, USA*
Abraham P. Friedman, *First Lt., MSC, USA*
Harold J. Funke, *CWOHC, USN*
Robert D. Gamble, *Capt., MC, USA*
Clarence G. Gates, *First Lt., MSC, USA*
Chester J. Gibson, *First Lt., DC, USA*
Albert J. Gilbert, Jr., *First Lt., DC, USA*
Josephine M. Gill, *Capt., ANC, USA*
Edward J. Guy, *First Lt., MC, USA*
Charles H. Hamann, *First Lt., MSC, USA*
Robert J. Harvey, *Lt. (jg) (MC) USNR*
Chester R. Hastings, *First Lt., MC, USA*
George B. Heckler, *Capt., MC, USA*
Andrew N. Heinrichs, *First Lt., MC, USA*
Daniel L. Herbst, *First Lt., MSC, USA*
Arthur L. Hinman, *First Lt., DC, USA*
George D. Hopkins, *Capt., MC, USA*
Ivan R. Hubbard, *First Lt., MSC, USA*
Ermo P. Ingel, *Capt., MC, USA*
Richard B. Irvine, *First Lt., MC, USA*
Ernest K. James, *Lt., DC, USA*
William C. Jung, *First Lt., MSC, USA*
Donald Kent, *Lt. (jg) (MC) USNR*
Helen H. King, *Capt., USAF (NC)*
Frank H. Klepacki, *First Lt., DC, USA*
Milton J. Knapp, *First Lt., DC, USA*
Arthur L. Kretchmar, *Capt., MSC, USA*

*Oak Leaf Cluster

In this department each month the names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force since the beginning of the Korean campaign are published following receipt of this information from official sources—*Editor.*

BRONZE STAR MEDAL—Continued

Keith F. Kuhlman, *First Lt., MC, USA*
James M. Lawson, *First Lt., MC, USA*
Prosper J. Levasseur, *First Lt., MSC, USA*
John P. Luhr, *Lt. (jg) (MC) USN*
Ross L. Magee, *Capt., MC, USA*
Harry P. Makel, *Maj., MC, USA*
Lloyd B. McCabe, *Capt., MC, USA*
Joseph H. McFarland, *Second Lt., MSC, USA*
James K. Merrill, *First Lt., MC, USA*
George R. Moffitt, *Lt. (jg) (MC) USNR*
William W. Montgomery, *Lt. (jg) (MC) USNR*
Harold G. Muchmore, *Maj., USAF (MC)*
Nelson Bertle, *First Lt., MC, USA*
Daniel M. O' Toole, *Lt. (jg) (MC) USNR*
Walter A. Pashuck, *Capt., MSC, USA*
Arthur H. Perkins, *First Lt., USAF (MSC)*
Kathleen W. Phillips, *Capt., ANC, USA*
Hubert C. Pirkle, *Lt., (jg) (MC) USNR*
Florian J. Ragaz, *Capt., USAF (MC)*
Arthur C. Richards, Jr., *Capt., MC, USA*
Leigh M. Roberts, *Lt. (jg) (MC) USNR**
Lawrence Robinow, *First Lt., MSC, USA*
Augustine M. Salcido, *Capt., MSC, USA*
Leroy C. Schleicher, *Lt. (MC) USNR*
Robert W. Schroeder, *Capt., MC, USA*
Daniel F. Shea, *Capt., DC, USA*
Robert D. Short, *First Lt., MSC, USA*
Orne D. Smith, *Lt. Col., MSC, USA*
Hazel I. Snowden, *Maj., ANC, USA*
Victor Stallone, Jr., *Lt. (jg) (MC) USNR*
James H. Stewart, *Lt. (MC) USN*
Paul E. Teschan, *Capt., MC, USA*
Joseph G. Teter, *First Lt., MC, USA*
Walter J. Walthers, *Lt. Col., USAF (DC)*
Charles W. Wren, *Capt., USAF (MC)*

AIR MEDAL

John A. Booth, *Lt. Col., USAF (MC)* *
John A. Nichols, *Capt., USAF (MC)*
Edgar L. Olson, *Col., USAF (MC)* *

COMMENDATION RIBBON

Frank E. Anderson, *Maj., USAF (MSC)*
Gustave T. Anderson, *Lt. Comdr. (MC) USN*
Robert A. Barnhart, *WOJG, MSC, USA*
Keerkor Bedayan, *Maj., MSC, USA*
Irving E. Belfield, *First Lt., DC, USA*
James H. Benner, *First Lt., MSC, USA*
Joseph Berman, *Capt., MC, USA*
Eugene F. Bleck, *Lt. (MC) USNR*
Robert J. Bohn, *First Lt., MSC, USA*
Robert M. Boughton, *Lt. (MC) USNR*
Gordon S. Boughton, *Capt., MSC, USA*
William C. Brandon, Jr., *Lt. Comdr. (DC) USN*
Sol D. Braver, *First Lt., MC, USA*
Arthur E. Brown, *Col., USAF (DC)* *
Robert T. Brown, *Lt. (jg) (MC) USNR*
Howard S. Browne, Jr., *Lt. (jg) (MC) USN*
Edwin W. Butler, *Capt., MC, USA*
John H. Caputi, *Lt. (jg) (MC) USNR*
Joseph W. Cleary, *First Lt., MC, USA*
Lyman W. Condie, *Lt. (jg) (MC) USNR*
Herbert L. Corse, *First Lt., MSC, USA*
Albert B. Council, Jr., *Lt. (jg) (MC) USNR*
William E. Dalrymple, *Capt., MSC, USA*
James B. Dibble, *Lt. (jg) (MC) USNR*
James P. Dobbins, *First Lt., MC, USA*
John A. Dodson, *First Lt., MC, USA*
George R. Farrell, *Lt. (jg) (MC) USNR*
Frederick J. Frese, Jr., *Col., USAF (MC)* *
Leroy F. Friend, *Comdr. (MC) USN*
Keith E. Galli, *Second Lt., MSC, USA*
Dean A. Garrett, *First Lt., USAF (MSC)*
James W. Gilchrest, *Lt. (MC) USNR*
Hermes C. Grillo, *Lt. (jg) (MC) USNR*
Gunnar H. Hage, *Lt. Col., MSC, USA*
Howard J. Hardin, *First Lt., MSC, USA*
Robert D. Hass, *Lt. (jg) (MC) USNR*
High B. Hatson, *Lt. (jg) (MC) USNR*
Ralph E. Haynes, *Lt. (MC) USN*
John H. Hebb, *Lt. (jg) (MC) USNR*
Herbert Hoff, *Lt. Col., MC, USA*
Leonard E. Johnson, *Comdr. (DC) USN*
Stanley L. Jukofsky, *Lt. (MC) USNR*
James F. Keenan, *Lt. (DC) USN*
Solomon L. Keith, *First Lt., MSC, USA*
Randall M. Kersten, *Lt. (jg) (MC) USNR*
Robert J. Kleinhenz, *Lt. (MC) USN*
Henry Kraus, *First Lt., MC, USA*
Rita I. LaCombe, *Capt., ANC, USA*
Richard H. Larson, *Lt. (jg) (MC) USNR*
Lowell L. Leishman, *Second Lt., MSC, USA*
John Leschena, *Capt., MSC, USA*
Douglas Lindsey, *Lt. Col., MC, USA*
Henry Litvin, *Lt. (jg) (MC) USNR*
William E. Mayer, *Lt. (MC) USNR*
John J. McHale, *Lt. (jg) (DC) USNR*
Clarence B. Mohler, *WOHC. USN*
James F. Mumma, *Lt (jg) (MC) USNR*
Wendell Naish, *Comdr. (DC) USN*
Patrick F. O' Connell, *Lt. (MC) USNR*
Lewis H. Oden, Jr., *Lt. Col., USAF (MSC)*

*Oak Leaf Cluster

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Internal Medicine

Founded in 1936, the American Board of Internal Medicine has certified more physicians than any other approved specialty board. On 30 June 1953, a total of 8,404 certificates had been issued of which 128 were received by regular Medical Corps officers of the U. S. Army, Navy, and Air Force. Subspecialty boards have been authorized in allergy, gastroenterology, cardiovascular disease, and pulmonary diseases.

The following regular officers, according to the respective surgeons general, have been certified in this specialty:

Saul B. Appel, *Maj., USA*
Frank H. Austin, *Capt., USA*

Theodore Bacharach, *Maj., USA*
William S. Bagnall, *Lt. Col., USA*
Frank L. Bauer, *Lt. Col., USA*
Charles F. Behrens, *Rear Adm., USN*
Wilbur C. Berry, *Col., USA*
Clifford A. Best, *Col., USA*
Albert A. Biederman, *Col., USA*
Robert E. Blount, *Col., USA*
Donald T. Book, *Maj., USA*
Aubrey L. Bradford, *Col., USA*

George W. Calver, *Rear Adm., USN*
George L. Calvy, *Comdr., USN*
Robert O. Canada, *Comdr., USN*
David Carmichael, Jr., *Lt., USN*
Hubert H. Carroll, *Capt., USN*
Robert L. Chancey, *Maj., USAF*
William L. Chapman, *Lt., USN*
Robert N. Class, *Maj., USAF*
Edward A. Cleve, *Col., USA*
Herbert W. Coone, *Col., USAF*
Ralph L. Cox, *Col., USA*
Morton C. Creditor, *Capt., USA*
Richard I. Crone, *Col., USA*
Dan Crozier, *Lt. Col., USA*
Tracy D. Cuttle, *Comdr., USN*

Merrill C. Davenport, *Col., USA*
Maurice C. Davidson, *Col., USA*
Stephen H. Deschamps, *Capt., USA*
David L. Deutsch, *Maj., USA*
Robert B. Dickerson, *Lt. Col., USA*

Warren H. Diessner, *Col., USA*
Melville M. Driskell, *Comdr., USN*
William G. Dunnington, *Lt. Col., USA*

Walter M. Edwards, *Lt. Col., USA*
Williford Eppas, *Capt., USA*
Earl F. Evans, *Capt., USN*

Paul S. Fancher, *Col., USA*
Robert B. Franklin, *Lt. Col., USA*
John L. Frazer, *Capt., USN*

William S. George, *Col., USA*
Horace C. Gibson, *Col., USA*
James O. Gillespie, *Brig. Gen., USA*
John E. Gorman, *Comdr., USN*
Edwin M. Goyette, *Col., USA*
Dell M. Gray, *Maj., USA*
Christian Gronbeck, Jr., *Lt. Col., USA*
Marshall E. Groover, Jr., *Col., USAF*

William R. Haas, *Col., USAF*
Paul Hayes, *Col., USA*
Alton R. Higgins, *Capt., USN*
Robert J. Hoagland, *Col., USA*
Archie A. Hoffman, *Lt. Col., USAF*
Frederic J. Hughes, Jr., *Lt. Col., USA*
Robert C. Hunter, *Lt. Col., USA*

Thomas W. Inmon, *Lt. Col., USA*

Thirl E. Jarrett, *Comdr., USN*
Edward J. Jaruszewski, *Comdr., USN*
Bruno Jastremski, *Col., USA*
Eugene V. Jobe, *Capt., USN*
Bruce W. Johnson, *Lt. Col., USAF*

This is the ninth of a series. The names of officers certified by the American Board of Pathology will be published in the July issue.

INTERNAL MEDICINE—Continued

Richard P. Johnson, *Col., USA*
Horace L. Jones, *Comdr., USN*

Emmett L. Kehoe, *Col., USA*
Edward C. Kenney, *Capt., USN*
William W. Kirk, *Capt., USN*

Karl M. Lacer, *Comdr., USN*
Arthur L. Lawler, *Capt., USN*
Charles L. Leedham, *Col., USA*
Julian Love, *Capt., USN*
Doss O. Lynn, *Col., USA*

John B. MacGregor, *Comdr., USN*
Thomas W. Mattingly, *Col., USA*
Marion E. McDowell, *Maj., USA*
Edward P. McLarney, *Capt., USN*
James A. McLaughlin, *Lt. Comdr., USN*
Jules J. McNerney, *Lt. Col., USA*

Urho R. Merikangas, *Col., USA*
Conn L. Milburn, *Col., USA*
Walter H. Moursund, Jr., *Col., USA*
Fred H. Mowrey, *Col., USA*
Robert K. Moxon, *Lt. Comdr., USN*

Robert S. Nelson, *Col., USA*
Lloyd R. Newhouser, *Capt., USN*
Byron A. Nichol, *Lt. Col., USA*
Irwin L. V. Norman, *Capt., USN*
Leon J. Numainville, *Col., USA*

Harry C. Oard, *Capt., USN*
James A. Orbison, *Lt. Col., USA*

John M. Packard, *Lt., USN*
Eddy D. Palmer, *Lt. Col., USA*
Ralph C. Parker, *Capt., USN*
Loren F. Parmley, Jr., *Lt. Col., USA*
Rufus J. Pearson, *Comdr., USN*
Wesley L. Peterson, Jr., *Capt., USAF*
Byron E. Pollock, *Col., USA*

Lester J. Pope, *Comdr., USN*
George M. Powell, *Col., USA*
William D. Preston, *Col., USAF*
Francis W. Pruitt, *Col., USA*

Ryle A. Radke, *Col., USA*
Harold E. Ratcliffe, *Lt. Col., USA*
Harvey E. Reitz, *Comdr., USN*
Edward A. Ricketts, *Lt. Col., USA*

Samuel H. Sandifer, *Lt. Col., USA*
John R. Seal, *Comdr., USN*
Christopher C. Shaw, *Capt., USN*
John A. Sheedy, *Maj., USA*
Daniel J. Sheehan, *Col., USA*
Jack C. Shrader, *Lt. Col., USAF*
James B. Shuler, *Capt., USN*
John K. Spitznagel, *Maj., USA*
William Stein, *Lt. Col., USA*
John T. B. Strode, *Col., USA*
Benjamin H. Sullivan, Jr., *Lt. Col., USA*

Carl W. Tempel, *Col., USA*
William G. Thalmann, *Lt. Col., USA*
James L. Tobin, *Col., USAF*

Joseph R. Vivas, *Lt. Col., USA*
Ralph Volk, *Comdr., USN*

Daniel J. Waligora, *Col., USA*
Weldon J. Walker, *Lt. Col., USA*
John H. Ward, *Capt., USN*
William M. Webb, *Lt. Col., USA*
William H. Westbrook, *Maj., USAF*
Major S. White, *Brig. Gen., USAF*
James A. Wier, *Lt. Col., USA*
William D. Willis, *Col., USA*

Charles T. Young, *Col., USA*

Anton Zikmund, *Capt., USN*

DEATHS

EMENS, Ethel Gladys, First Lieutenant, ANC, USAR, Walter Reed Army Hospital, Washington, D. C.; graduated from University of Buffalo School of Nursing in 1934; ordered to active duty 26 November 1943; died 23 April 1954, age 43, in Washington of hemangiopericytoma of the cervical spine.

MANNING, Joseph Crockett, Captain, USAFR (MC), U. S. Air Force Hospital, Tinker Air Force Base, Okla.; graduated from University of Tennessee College of Medicine, Memphis, Tenn., in 1942; ordered to active duty 29 March 1953; died 3 April 1954, age 37, at the U. S. Air Force Hospital, Sheppard Air Force Base, Tex., of bronchogenic carcinoma.

NEUSTEIN, Dudley Howard, Captain, MC, USAR, U. S. Army Hospital, Fort Campbell, Ky.; graduated from Chicago Medical School in 1949; ordered to active duty in October 1952; died 27 December 1953, age 32, of injuries received in an automobile accident near Chester, Ill.

A MESSAGE FROM THE A. M. A.

On 15 July 1952 the Council on National Emergency Medical Service of the American Medical Association initiated a continuing opinion survey of physicians being released from active military service. The information obtained is useful to the Council and the medical profession in connection with the utilization of medical personnel by the armed services. During the first year of the survey, a total of 3,948 completed questionnaires were returned, which represents about a 70 percent response.

The questionnaire used during the first year of the survey contained 37 questions and was designed to show (1) general information about the physician such as age, education, et cetera; (2) the extent of his military training, his military department, rank, current military status, and special military courses received; (3) the type of work performed while in service, the efficiency of utilization, the percentage of time spent on the care of military personnel, dependents, and others; (4) staffing conditions for physicians and allied health personnel; and (5) comments and suggestions not only with respect to the armed services but also concerning the ways in which organized medicine can be of greater assistance to the physician in uniform.

A brief summary of some of the information obtained which is of general interest to physicians in service is presented in this issue. Additional information will be presented in the July issue of the *Journal*.

Time spent in service. The survey shows that the average total time spent in the service by those responding was 24.7 months. The average tour of duty in the United States was 7.6 months, and the average tour of foreign duty was 17.1 months.

Age distribution by service. The largest age group, at time of separation, covered the ages 30 to 34, the second largest group covered the ages 25 to 29. By service, the 30- to 34-year-old group was the largest in the Army and Air Force, while the 25- to 29-year-old group was largest in the Navy. Likewise, there were more in the "40 and over" group in the Army and Air Force than in the Navy.

Physicians' evaluation of staffing conditions. Of those responding, about 19 percent in the Army thought there was over-

From the Council on National Emergency Medical Service of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—*Editor.*

staffing; 29 percent, that there was understaffing; and 52 percent thought that the staffing was adequate. In the Navy 31 percent thought there was overstaffing; 16 percent, that there was understaffing; and 53 percent, that the staffing was adequate. In the Air Force 42 percent thought there was overstaffing; 17 percent, that there was understaffing; and 41 percent, that the staffing was adequate. In terms of totals for all the armed services, 29 percent thought there was overstaffing; 20 percent, that there was understaffing; and 51 percent thought the staffing was adequate.

Distribution of physicians by rank at time of discharge. The survey indicates that the majority of physicians in all three services at time of separation held the rank of captain in the Army and Air Force or lieutenant in the Navy. It is significant to note that a larger percentage of the lowest rank is found in the Navy (lieutenant, junior grade) than in the other services, and there is a correspondingly lower percentage of grades above this level in the Navy than in the other military departments. The percentage of captains in the Air Force was much higher than the comparable grade in the other services.

Number of years since graduation. The survey showed that by far the majority of those responding (78.8 percent) graduated from medical school between the years 1945 and 1949; the second largest group (9.6 percent) graduated between 1940 and 1944; and the third largest group (7.2 percent) graduated in 1950 and later. A few (4.4 percent) graduated before 1940.

Years of internship and residency. A majority of those responding (88.7 percent) had one year of internship training, while 26.9 percent had no residency training, 27.6 percent had one year of residency, 19.6 percent had two years of residency, and 15.3 percent had three years.

Occupation at time of entering service. A question was asked designed to ascertain the type of occupation in which the physician was engaged at the time of his entrance on active duty. The answers show that a majority were in residency training at the time of beginning service and the second largest group was in internship. The third largest group was engaged in general practice, and the fourth largest group was engaged in a full-time specialty practice. The remainder were in other occupations such as industrial practice and government service.

Number of physicians holding board certificates. A total of 270 of those who responded to the questionnaire held board certificates. Of these, 144 were in the Army, 69 in the Navy, and 57 were in the Air Force. Specialties covered a number of different fields. The greatest number of physicians were cer-

tified in pediatrics, and the second and third largest in internal medicine and surgery, respectively. By service, a total of 10.5 percent of those responding in the Army, 4.1 percent of those in the Navy, and 6.7 percent of those in the Air Force had certificates. A total of 6.9 percent of physicians in the three services had specialty board certificates.

LETTER TO THE EDITOR

FISH POISONING IN THE PACIFIC

To the Editor:—The recent excellent report of Halstead and Lively* in the February issue of the *Journal* recalls the only case of fish poisoning I have seen—one at the Kwajalein Naval Base in the Marshall Islands in July 1948 while on a tour of the Far East Command as consultant in surgery for the Surgeon General of the Army. During a delay of 12 hours at Kwajalein Dr. George Griffith and I were invited by a naval medical officer to see a case of fish poisoning.

Several sailors, while fishing late in the afternoon, had caught a yellowtail or yellowjack—a variety of Pacific tuna which is ordinarily not poisonous—and they ate it for supper. All became ill and had been brought to the sick bay not long before we saw them. The one seriously ill patient was apprehensive and felt numb. He had a marked positive Chvostek sign. A light tap on the cheek would throw his face into a violent spasm. The tip of his tongue was so sensitive that when he touched it to his teeth, he felt as if he had received an electric shock in his tongue. A tongue depressor produced the same effect. He had a marked carpopedal spasm. There was a loss of superficial skin sensation below the neck to a pin prick, but deep (muscle) sensation was present. The superficial and deep reflexes were absent below the neck. The diaphragm moved normally but the intercostal muscles were weak.

Dr. Griffith believed that the patient's signs and symptoms, especially the carpopedal spasm and positive Chvostek sign, indicated a lack of calcium in his blood. He thought that possibly the fish poison had caused the blood calcium to be bound in the tissues and not available in the circulating blood. The patient was given 2 grams of calcium gluconate intravenously and within 10 minutes his symptoms had entirely disappeared. Because we departed soon after, I do not know whether or not he had a recurrence of his symptoms and, if so, whether or not additional calcium gluconate intravenously would have helped him.

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BOOK REVIEWS

GLOBAL EPIDEMIOLOGY, A Geography of Disease and Sanitation. Volume III, The Near and Middle East, by *James Stevens Simmons,* M. D., Ph. D., Dr. P. H., Brigadier General, USA, Retired; *Tom F. Whayne,* M. D., Dr. P. H., Colonel, MC, USA; *Gaylord W. Anderson,* M. D., Dr. P. H.; *Harold Maclachlan Horack,* M. D. 357 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $12.

This is the third reference volume by the same authors devoted to problems of health, disease, and sanitary conditions in a relatively little known area of the modern world. The geography and climate of each country are discussed briefly and considerable discussion is devoted to its socioeconomic conditions including population, vital statistics, wealth, food and housing, and to a description of its environmental and sanitary factors. These factors, in great measure, dictate the types of health organizations and medical facilities that are necessary in each country. The discussions of disease incidences are arranged by systems, but the remarkable fact is that there is so little medical knowledge of the Middle East countries.

Improvement in orienting the reader has been made over the previous volume by the use of a map of the country concerned at the beginning of each chapter. Relief maps would have been helpful and saved description of the height of mountains, river courses, and other important terrain features in a clearer manner. The multilingual bibliography at the end of each chapter is of value to persons desiring more detail in any particular. There is a useful index which lists the diseases, with the page references by country.

To those physicians, economists, and politicians responsible for the health and welfare of their own countries, and to those who must assist the more backward areas in these matters, this book and the entire series will serve as a basic text.

—*GOTTLIEB L. ORTH, Col., MC, USA*

SPACE TRAVEL, by *Kenneth W. Gatland* and *Anthony M. Kunesch.* 205 pages; illustrated by photographs and drawings. Drawings by *J. W. Wood* and *R. A. Smith.* Philosophical Library, New York, N. Y., 1953. Price $4.75.

This is a popular history of the development of rockets combined with considerable imaginative speculation on the possibility of man's flight into space. Written by two English authors, one of whom is secretary of the British Interplanetary Society, the book outlines in detail the early work of Goddard in this country and of Oberth in Germany and his student, von Braun, "(who) was largely responsible for the V-2 long-

range rocket." From the earlier factual chapters, the authors proceed on the assumption that space flight has become a reality and take the reader on an interplanetary project which "probably will have its beginning on a remote island somewhere in the Pacific."

A mixture of science and fiction, this small volume is interesting reading for the curious layman who desires a gentleman's knowledge of a vast and complex scientific field. Unfortunately, the important contributions of aviation medicine to flight beyond the stratosphere are limited to a brief description of the U. S. Navy's so called "space suit," Henry's work with mice under zero gravity conditions, and a discussion of the various human centrifuges that have been constructed. No mention is made of the significant contributions of the Habers, Strughold, and Buettner at the U. S. Air Force School of Aviation Medicine. The inclusion of numerous photographs and drawings adds to the volume's attractiveness, but the bibliography and index are limited. Obviously the authors have tried imaginatively to scale the high wall of security classification which encompasses all important research and development in this field.—*ROBERT J. BENFORD, Col., USAF (MC)*

THE OFFICER'S GUIDE, 20th edition, A Ready Reference on Customs and Correct Procedures Which Pertain to Commissioned Officers of the United States Army. 569 pages; illustrated. The Military Service Publishing Co., Harrisburg, Pa., 1954. Price $4.

This book, with a new edition printed almost yearly, is a reliable, although not official, source of information for Army officers and their families. This edition includes the usual subject matter which has been brought up to date. A list of synonyms useful in preparing efficiency reports has been added. An explanation of the recent survivor's benefit law is contained in the chapter on life insurance analysis and this chapter alone is worth the price of the book.

The text is easy to read, well indexed and is a valuable reference book for all Army officers.—*PATRICK I. McSHANE, Col., MC, USA*

SURGICAL PATHOLOGY, by *Peter A. Herbut,* M. D. 2d edition. 893 pages; thoroughly revised, with 528 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $14.

The author has improved an already excellent text in this second edition. The material covers all the major surgical specialties, and brief descriptions of the embryology, anatomy, and histology of each system are given. The reviewer was delighted to find newer ideas from current literature throughout this truly up-to-date book. The photographs are of excellent quality and well selected. This edition includes 124 new illustrations, a new chapter on the adrenal glands, and a chapter by Dr. Bernard J. Alpers on the central nervous system.

The book will be valuable to surgical pathologists and is highly recommended for surgeons preparing for surgical board certifying examinations.—*WILLIAM O. UMIKER, M. D.*

NUCLEAR PHYSICS, by *W. Heisenberg.* 225 pages; illustrated. Philosophical Library, New York, N. Y., 1953. Price $4.75.

This volume by Professor Heisenberg is an interesting addition to the publications in the field of nuclear physics; however, it will not be of general interest to the majority of physicians. In the preface, the author states his intention of writing a book that will serve as an introduction to nuclear physics but, unfortunately, he does not fully manage to attain this objective. His work is too advanced for the beginner who might be expected to obtain the most from it, and too elementary to retain the interest of a person trained in this field.

The first chapter on the history of the atomic theory is very readable but the last chapter, which gives details of the status of atomic research in Germany immediately before and during World War II, will perhaps be of most general interest. The general outline, proceeding from the history of the subject through the basic principles of radioactivity and nuclear forces to the practical application of these principles in the various sciences, is very commendable.

This volume is an interesting, altogether readable book, which, while it does not go too deeply into the subject of nuclear physics, yet demands a certain amount of thoughtful consideration on the part of the reader. — *LOUIS E. BROWNING, Lt. Col., MC, USA*

PHARMACOLOGY, by *J. H. Gaddum,* Sc. D. 4th edition. Oxford Medical Publications. 562 pages; illustrated. Oxford University Press, New York, N. Y., 1953.

As stated in the preface to the first edition, this textbook of pharmacology is "intended to be used by medical students at a stage in their education before general principles become obscured by a mass of practical details, but may also interest others." Experimental methods used to develop many new therapeutic drugs, some of which are potentially dangerous, are discussed so physicians will have a knowledge of the evidence justifying a trial for new drugs.

This edition has been completely revised to include the newer therapeutically important drugs. The main additions and alterations concern the anterior pituitary gland products, synthetic analgesics, the blockade of autonomic ganglia and neuromuscular junctions, vitamin B_{12}, nuclear poisons, and antibiotics. The material is well organized with drugs grouped largely on a basis of their site of action and therapeutic activity, and indexed with entries for both drugs and diseases. The actions, indications, toxic effects, dosages and methods of administration of the drugs are described as well as experimental procedures used in testing new drugs.

This is an excellent pharmacology text for the purpose intended. Charts, photographs, and tables are extensively used, but the book is lacking in sufficient detailed information to be of value as a reference text. — *HENRY D. ROTH, Lt. Col., MSC, USA*

HANDBOOK OF DIFFERENTIAL DIAGNOSIS, by *Harold Thomas Hyman*, M. D. 716 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $6.75.

In this handbook the author lists possible causes for diseased states encountered in medical practice and gives for each, in telegraphic language, a pathognomonic or suggestive symptom, sign, laboratory data, and indicated therapeutic tests. The book begins with an index of 1,585 signs and symptoms directing the reader to one of the 232 divisions of differential diagnosis, alphabetically arranged.

The cataloging of causative possibilities for the many abnormalities listed is like an encylopedic index and is disappointing in differential diagnosis. The material more nearly resembles a notebook with only a word or phrase concerning the condition in question. There are many references to charts and additional remarks concerning the disease or causative agent in question, which are considered inadequate. There is no discussion or indication of the more common conditions that should be considered in preference to the extremely rare ones. The advice concerning the therapeutic response is often faulty. The reader is advised to observe the therapeutic response to ACTH or cortisone when their use might not be the proper treatment.

Because of inadequate discussion and inappropriate suggestions for therapeutic trials, this volume would be of little value for the student or physician other than to list the many conditions that cause signs or symptoms of disease.—*DOSS O. LYNN, Col., MC, USA*

AN ATLAS OF PELVIC OPERATIONS, by *Langdon Parsons*, M. D., and *Howard Ulfelder*, M. D. Illustrated by *Mildred B. Codding*, A. B., M. A., Surgical Artist, Department of Surgery, Harvard Medical School and Peter Bent Brigham Hospital, Boston, Mass. 231 pages. W. B. Saunders Co., Philadelphia, Pa., 1953.

This volume is the first published atlas of surgical operations of the pelvis from the gynecologist's point of view, and its purpose, the teaching of the technical details of pelvic surgery by means of illustration, has been ably accomplished. Text material is limited to points of technic and helpful hints regarding safe, simple methods for coping with trouble areas in operation of the female pelvis, as explanatory supplement to the clear and detailed illustrations. Simplicity and clarity is maintained by presenting text and illustrations on the same page. Modifications of basic technic are illustrated to explain common variations or complications. For example, in the case of total hysterectomy, the procedure is prefaced by an explanatory section on total abdominal hysterectomy, then illustrated in logical stepwise fashion, and finally by the procedures and steps followed when hysterectomy is accompanied by removal of adnexal structures, complicated by additional problems of stress incontinence as handled from above, or complicated by cervical fibroid with displacement of the ureter or by inflammatory fixation of the pelvic viscera, and so forth.

The atlas is divided into three sections, namely, abdominal operations, vaginal and perineal operations, and operations for malignant disease. The first section lists conservative operations of the uterus and adnexal structures, including uterine suspension, presacral neurectomy, wedge resection and exploratory incision of the ovary, and sterilization and plastic procedures on the tube, and further treats all procedures involving the intestinal and urinary tracts which the gynecologist may inadvertently encounter. The vaginal and perineal section contains the complete repertoire of vaginal plastic procedures, combined abdominal and vaginal procedures, the repair of fistulas, and the various minor procedures involving the cervix and vulva. Finally, the section on operations for malignant disease includes the more radical procedure of Wertheim hysterectomy and pelvic lymphadenectomy, combined abdominal and perineal resection of the rectum, radical vulvectomy, superficial and radical groin dissection, and extraperitoneal lymphadenectomy.

This atlas will prove most useful for student gynecologists, as well as for those in general practice and general surgery who encounter pelvic surgery and desire a clear and concise presentation of proved methods in developing their own skill and technic.—*JOHN A. PEASE, Comdr. (MC) USN*

THE CHILD, HIS PARENTS AND THE NURSE, by *Florence G. Blake,* R. N., M. A. 440 pages. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $5.

This book was written primarily to "deepen nurses' and parents' understanding of children and to make it possible for them to obtain increased pleasure in their experiences with them." It presents recent concepts and trends in maternity and pediatric nursing accepted by other allied professions. The increasing importance of the nurse in the field of preventive mental health is stressed and positive suggestions in nursing education are offered.

The book is divided into flexible growth phases; the needs of the expectant parents are met by their proper guidance. Differing from the usual text in pediatric nursing, it is centered on the patient and family rather than on disease and procedure. The emphasis is on improvement of interpersonal relationships to meet the needs of the patient and the nurse.

There are many authoritative quotations and illustrative examples from various fields of human development and behavior. Up-to-date reference material is presented at the end of each chapter. The "questions to guide observations" section stimulates thinking and should prove an incentive toward self-study.

This book can be used as a reference by all nurses. It should prove of particular interest to nurses in advanced fields of pediatrics, obstetrics, public health, and hospital administration.

—*LEONA WEINER, First Lt., ANC, USA*

CLINICAL ROENTGENOLOGY, Volume I, Developmental and Systemic Conditions and Local Lesions in the Extremities, by *Alfred A. de Lorimier,* M. D.; *Henry G. Moebring,* M. D.; and *John R. Hannan,* M. D. 495 pages; 782 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $18.50.

This is the first of four volumes to be published as a major reference work on diagnostic roentgenology by three authors, all of whom were formerly assigned to teaching posts at the Army Medical School in Washington, D. C., and the Army Roentgenology School in Memphis, Tenn., from which much of the material was obtained. They state that it is their intention to simplify the problem of identifying different disorders. They begin by reviewing the underlying basic principles, then proceed to a consideration of the characteristic roentgenogram, a brief summary of clinical and laboratory findings, and finally the differential diagnosis.

The conditions covered in this volume are those affecting the extremities, both local and systemic. The material is grouped under the following headings: developmental malformations, traumatic lesions, metabolic disorders, endocrinopathies, infections, neoplasms, blood dyscrasias, miscellaneous, arthropathies, and a short discussion of venography and sinus tract injections.

The book has two outstanding features. First, the authors have eliminated the verbosity found in so many texts; the language is clear and concise. Second, there are a large number of reproductions of roentgenograms, which seems essential in a book devoted to this subject. The reproductions are in a readable form, both as to size and detail. The sizable print and quality paper are additional features of note. A list of references follows the discussion of each subject, and the material is well indexed.

This book will be of considerable interest as a general reference work, both to the student and to all physicians concerned with x-ray diagnosis.— *CLEMENT D. BURROUGHS, Comdr. (MC) USN*

REVIEW OF PHYSIOLOGICAL CHEMISTRY, by *Harold A. Harper,* Ph. D. 4th edition. 328 pages; illustrated. Lange Medical Publications, University Medical Publishers, Los Altos, Calif., 1953. Price $4.

This new edition is an excellent review of the fundamentals of physiologic chemistry which emphasizes the accepted concepts of the subject. It is a review and must be supplemented by standard texts, monographs, and journals when more complete information is desired.

The author has retained in the first chapter a simple presentation of the principles of general and physical chemistry which are frequently forgotten by those not engaged in teaching or research in this field. This is followed by chapters on the chemistry of the carbohydrates, lipids, proteins, nucleoproteins and nucleic acids, vitamins, and

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enzymes. Separate chapters are devoted to biologic oxidations, the blood, lymph and cerebrospinal fluid, the chemistry of respiration, digestion and absorption, detoxication, metabolism of carbohydrates, fats, proteins, nucleic acids and their derivatives, functions and tests of the liver, the kidney and the urine, water and mineral metabolism, the chemistry and functions of the hormones, calorimetry and the elements of nutrition, and chemistry of the tissues.

There are many excellent charts, graphs. illustrations, and tables which aid in understanding the various physiologic mechanisms. The book will be helpful to physicians and others desiring a quick review of biochemistry.— *ERNEST M. PARROTT, Maj., MSC, USAR*

UROLOGICAL PRACTICE, by *Roger W. Barnes,* M.D., and *Henry L. Hadley,* M.D. 494 pages; illustrated. The C.V. Mosby Co., St. Louis, Mo., 1954. Price $12.50.

The authors have accomplished their objective of providing a quick reference to aid general practitioners in the diagnosis and treatment of common urogenital diseases.

The book has two parts. In Part I, 70 pages are devoted to an alphabetical listing of all symptoms and signs of urogenital disease and related conditions. These items are defined or described, and subheadings are included in outline form which enumerate the causes or conditions responsible for the symptoms or findings. References to later chapters in the book are usually given. The subheadings contain brief but pertinent information helpful in the diagnosis of these lesions. The symptomatic treatment of urogenital disorders is listed under the symptoms and findings.

Part II includes the subject matter usually found in urologic texts with the addition of chapters on differential diagnosis of abdominal pain, infertility in women, and nonsurgical diseases of the kidney. This portion of the book is clearly and simply presented, but adequate detail is given for common conditions. The more rare lesions are briefly discussed. The authors state that early diagnosis of testicular tumors with prompt orchiectomy offers the best hope of cure, mention that the radical operation involving retroperitoneal lymph node removal is being done, but do not give results. Kimbrough in 1951 demonstrated statistically in five year survival rate the superiority of the radical operation over simple orchiectomy by about 25 percent.

A brief discussion of the medicolegal status of sterilization operations (vasectomy or vasoligation) is commendable because this subject usually is not included in urologic texts. Photographs of roentgenograms clearly showing the structures and abnormalities described are of superb quality throughout. The illustrations as well as the index are good, but a bibliography is not included.

—*SIDNEY MILLER, Lt. Col., MC, USA*

THE BALLISTOCARDIOGRAM, A Dynamic Record of the Heart Beat, by *John R. Braunstein,* M.D., Ph.D. 84 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.

The author of this short monograph wisely states in his preface that the time is not yet ripe for a text on the subject of ballistocardiography. He has fulfilled a most important function, however, for the student or specialist who is not familiar with this particular field, by outlining the history, description of instruments, physics, and mathematics of this system of analyzing cardiovascular activity. The descriptive chapters are clear and should be easily understood by the average medical reader. The mathematical aspects of the subject are not dispersed in the text in such a way as to confuse the average reader, but are concentrated in the appendix where they are readily available.

This handy-sized booklet is definitely recommended for all those planning to use the ballistocardiograph or read the literature on ballistocardiography.—*RALPH C. PARKER, Jr., Capt. (MC) USN*

THE CHEST, A Handbook of Roentgen Diagnosis, by *Leo G. Rigler,* M. D. 2d edition. 380 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $8.

This small handbook of roentgen diagnosis in chest diseases contains an immense amount of information presented in the well organized and authoritative style of an experienced and widely acclaimed teacher of radiology. The author has skillfully and successfully employed the atlas method to achieve his purpose, which is "to provide a foundation of knowledge and a guide for the analysis of any roentgenogram of the chest."

The book is divided in three sections. The first contains an introduction and outline of methods of roentgen examination of the chest. The second section consists of a concise description of the normal chest with its variations and a discussion of the physiology of the respiratory tract. The final section concerns pathologic conditions and contains excellent radiographic illustrations with appropriate interpretations.

The most notable revisions in this edition concern advances in the details of the methods of roentgen examinations and diagnostic signs. Newer terminology, numerical designation of the bronchi, advanced technics in bronchography, some recent material regarding the early diagnosis of lung tumors and new illustrations have been added. This edition will not necessarily induce owners of the first edition to discard their copies in its favor, because, as the author admits, "there have been no sensational discoveries in roentgen diagnosis of the chest during the past five years." Nevertheless, either or both editions should find an appropriate place in the library of any student, specialist, or institution of teaching in the field of radiology.

—*KENNETH L. McEWEN, Maj., MC, USA*

THE DIGESTIVE TRACT IN ROENTGENOLOGY, Volumes I and II, by *Jacob Buckstein*, M. D. 2d edition. Volume I, 544 pages; Volume II, 658 pages; 1,534 illustrations in 897 figures. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $30 set.

This two-volume book is a complete treatise on the roentgenologic demonstrations of the normal gastrointestinal tract, its malformations, and diseases. Although the author has for sake of completeness included rare conditions, he has placed major emphasis on the lesions more commonly seen by internist, gastroenterologists, and radiologists in their practice. All the roentgenologic material included was proved by operation or autopsy, and the correlation of the essential clinical features with the roentgenographic and pathologic findings was stressed throughout.

This expanded new edition, published six years after the first edition, includes a large amount of new material. The division of the material into two volumes necessitated by the increase in knowledge has considerably enhanced the book's usefulness. Volume I includes an interesting history of the study of the alimentary tract by roentgenoscopic and roentgenographic methods. The author then discusses the hypopharynx, esophagus, stomach, and duodenum, their anomalies, diseases, and methods of examining them roentgenologically. In Volume II the small intestine, large intestine, diaphragm, gallbladder and bile ducts, spleen, liver, and pancreas are similarly treated. The anatomy, physiology, technic of examination, and roentgen findings in each division of the gastrointestinal system are thoroughly and clearly described. The illustrations, of great importance in books on radiology, supplement excellently the described roentgenographic images.

This book will prove of value to all physicians who are interested in the study of the gastrointestinal tract, and to teachers of radiology and gastroenterology.—*HAROLD I. AMORY, Col., MC, USA*

HYPERTENSIVE DISEASES, Causes and Control, by *Henry A. Schroeder*, M. D., F. A. C. P. 610 pages; 164 illustrations and 3 colored plates. Lea & Febiger, Philadelphia, Pa., 1953. Price $10.

This textbook is a broad review of the problems presented by hypertensive diseases. It is an interestingly written volume in which the stimulating thoughts of the author make factual presentation of theory, statistics, diagnosis, and therapy far better reading than average. The book serves both as a teaching text and as a reference guide for beginning research. Frequent clinical observations and use of illustrative case records emphasize the characteristics of the various hypertensive disease entities.

Four chapters by other authors on certain causative factors, nitrogen compounds, hormonal factors, and pheochromocytoma are included. There are extensive chapters on diagnosis, prognosis, and therapy. The author frequently expresses his positive opinion, but when there is

room for debate he stimulates the reader's desire for study and investigation. The ultimate aim "is complete understanding (of hypertension) leading to prevention."

The type, paper, and binding are excellent. Diagrams and graphic charts are abundant and sharply delineated. A bibliography follows each chapter, and a detailed author's index and subject index close the text.— *WILLIAM W. KIRK, Capt. (MC) USN*

PHYSIOLOGICAL CARDIOLOGY, by *Arthur Ruskin,* M. D. Edited by *Robert F. Pitts,* M. D. 370 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $8.

In this monograph the author achieves in admirable manner his objective of successfully relating experimental and clinical research in basic sciences to clinical cardiology. When pathologic anatomy, biochemistry, and pharmacology, among others, are germane to a particular subject, they are skillfully integrated with the main theme. Technical matters are concisely presented in an understandable manner. One of the most gratifying features of this book is the facility with which the author is able to orient the reader toward the practical application of complex physiologic knowledge.

The subject matter covered in each chapter follows a similar plan. A general introduction embodying brief causative and pathogenetic considerations is followed by a detailed discussion of the altered cardiovascular function. The clinicopathologic features are integrated with the pathophysiologic consequences of the particular disease in an excellent manner. Therapeutic implications are well correlated with these discussions, and provide a rational basis for management. The several chapters are well balanced and space is given proportionate to the importance of the subject. The controversy of "forward failure" versus "backward failure" is surveyed adequately, but not belabored. The brief commentary on refractory congestive heart failure could be profitably amplified. In addition to excellent discussions on the common cardiovascular diseases, informative chapters on the heart in nephritis, hypotensive cardiovascular syndromes, cor pulmonale, functional cardiovascular syndromes and pericardial compression are included. The one on endocrine and metabolic syndromes which includes discussions regarding the cardiovascular alterations associated with pregnancy, obesity, and starvation is particularly noteworthy.

The excellent index is carefully compiled and the references, while not exhaustive, are well chosen. This monograph, though not intended as a complete cardiology text, effectively complements existing standard books on this subject and will constitute a notable addition to the bookshelf of any internist, particularly those interested in cardiovascular disease.—*JAMES A. ORBISON, Lt. Col., MC, USA*

PATHOLOGY, by *W. A. D. Anderson,* M. D. 1,393 pages; with 1,241 illustrations and 10 color plates. 2d edition. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $16.

In the second edition of this textbook of pathology the editor, as before, has collaborated with 32 outstanding pathologists, each an authority on the subject of his particular chapter. The authors are substantially the same although one has been deleted and two new ones added. Substitution of the double column for the single column permits greater reading ease, and is the only change in format.

The arrangement of the book's contents has been altered only slightly, and only one substitution has been made among the original 10 color plates; however, many of the black and white illustrations have been replaced and 58 added, bringing the total to 1,241. These are for the most part excellent. The number of references at the end of some chapters is voluminous and, in one case totals 389.

Revisions of the material in this edition are minimal, and are confined mainly to details of recently acquired medical knowledge. Some subjects, such as the effects of ACTH and cortisone, have been broadened, and others, such as the discussion of retrolental fibroplasia, have been added. Some have been shortened for the sake of balance in accordance with present-day trends of disease processes. There is no reference to epidemic hemorrhagic fever, though perhaps it was omitted because it is not endemic in this country. As in the first edition, relative prominence is given to effects of radiation, tropical diseases, and pathology of the skin, skeletal, and nervous systems.

As a standard, comprehensive, up-to-date textbook for both undergraduates and graduates in medicine, this book is highly recommended. The objective of the original edition, to provide a single volume text on pathology, has been adhered to, and the work remains one of the most comprehensive and authoritative of its kind.

—*WILLIAM M. SILLIPHANT, Capt. (MC) USN*

HISTOLOGY, by *Arthur Worth Ham,* M.B., F.R.S.C. 2d edition. 866 pages; 518 figure numbers, including 7 plates in color. J.B. Lippincott Co., Philadelphia, Pa., publisher, 1953. Price $10.

Understandability was the basic concept behind the planning of the original edition of this widely acclaimed textbook of histology. The difficulties of three-dimensional visualization were considered, the common artifacts were explained, and histologic structure was correlated with the other basic medical sciences as well as with the practice of medicine itself. Special emphasis was given to those phases of histology related to degenerative diseases of the heart and arteries, to cancer, to burns and skin grafting, and to endocrinology.

The new second edition retains all the excellent features of the original, and embodies the striking advances made in histology in recent years. Numerous sections have been rewritten, notably those dealing

with cells, intercellular substances, bone, nervous tissue, the liver, the kidneys, and the adrenal cortex. There are new sections on the impulse-conducting system of the heart, the structure of lymphatics, the structure and growth of lung alveoli, and many other fields in which advances have been made.

The coverage is reasonably complete. Although the material is presented in relatively simple form for the use of medical and dental students, the more advanced reader can find references for additional information on almost any topic. Extensive and up-to-date bibliographies follow 28 of the 30 chapters. The 518 illustrations, 73 more than in the original edition, include many especially good electron micrographs and photomicrographs. The index is unusually well cross-referenced.

This excellent textbook, while primarily designed for students, should be a valued addition to the reference library of anyone who wishes to improve his grasp of the modern knowledge of histology.

—*BENNETT F. AVERY, Capt. (MC) USN*

THE NURSE IN THE PUBLIC HEALTH PROGRAM, by *Pearl Parvin Coulter*, R.N., M.S. 309 pages. G.P. Putnam's Sons, New York, N.Y., 1954. Price $4.75.

This textbook is designed to orient the student nurse toward public health. The basic concept is that of "teamwork," the characteristics of which are defined in the first chapter. This concept is developed by discussion of the types of teamwork in which a nurse would participate in a public health program. In regard to each distinct team, such as that of nurse-doctor, nurse-family, or nurse-hospital, the history of the association is briefly outlined, and helps and hindrances to a good working relationship are indicated.

There is liberal use of thought-provoking devices, such as questions to be asked and answered by the individual nurse herself. Case studies are presented to illustrate various team relations and interactions, some showing good teamwork, others a poorer quality. In most instances, analysis of the quality of demonstrated teamwork is left to the reader. Each team relationship is discussed with reference to its unique problems.

The reader is given an outline of the varieties and types of services performed in the public health field by various groups and organizations. Statistical material is used sparingly, and when employed is incorporated into the text. Each chapter is thoroughly annotated, and the bibliography is adequate for any degree of further research desired by interested individuals.

This book should be of interest to student nurses and beginners in the field of public health. It can also be used as a reference volume on various types of public health services and the interrelationship involved in carrying them out smoothly and efficiently.

—*HEDWIG M.E. LINNENBRUEGGE, Lt. (NC) USN*

THE ADAPTIVE CHIN, by *E. Lloyd DuBrul,* D.D.S., and *Harry Sicher,* M.D. 97 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $3.50.

The theme of this monograph is speculation regarding the evolution of the chin of man. Part I presents a historical interpretation of the shifting relation of jaw segments, the influence of muscle action, and jaw retrusion and reduction. Part II compares the four principal themes of development, the shifting theory (Verschiebungslehre), the effects of articulate speech, the mechanical effects of retrusion of the teeth, and the effects of muscle activity. Part III consists of observations of the skull as a whole, of the mandible, and of the musculature. Part IV compares the evolution of the skull and mandible of the orders Lagomorpha, Carnivora, Notoungulata, and Primates. It is hypothecated that changes of skeletal form accompanying behavioral changes in bodily orientation have been found in orders entirely unrelated to each other or to the primates.

This monograph may be of academic interest to students of comparative anatomy and paleontology, and to research workers in the field of growth and development of the skull.

—*JAMES L. BRADLEY, Comdr. (DC) USN*

COAL TAR AND CUTANEOUS CARCINOGENESIS IN INDUSTRY, by *Frank C. Combes,* M.D. 76 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $2.75.

The advances of the chemical industry and the current world-wide interest in the cause and pathogenesis of cancer make this problem of interest and concern to all physicians. While the property of carcinogenic potency has long been associated with certain chemical compounds, its importance is stressed by the fact that over 300 are now capable of producing malignancy in laboratory animals and about 35 are capable of producing benign tumors.

The author presents the carcinogenic nature of the certain fractions of coal tar in a practical and effective manner. The text is organized in eight sections as follows: introduction; general nature of carcinogenesis; the tars; the carcinogenic hydrocarbons; photodynamic action of light; the dermatergoses due to coal tar; petroleum cancer; and advice for control of "tar cancer." The section dealing with the photodynamic action of light and certain coal tars, and their role in the production of cutaneous malignancies is of especial interest. The section on dermatergoses due to coal tars is also of interest and of great value to the dermatologist and the industrial physician.

The author has clarified a previously confusing aspect of cutaneous cancer and has produced a practical guide and approach to the ever growing problem of coal tars and cutaneous cancer. This monograph is recommended to all physicians who observe and treat cutaneous malignancies.—*WILLIAM N. PIPER, Lt. Col., MC, USA*

FRONTAL LOBES AND SCHIZOPHRENIA, edited by *Milton Greenblatt,* M. D., and *Harry C. Solomon,* M. D. 425 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., 1953. Price $12.50.

This book presents an exhaustive study of 116 patients with chronic schizophrenia subjected to lobotomy at the Boston Psychopathic Hospital. About three fourths of these patients were classified as "non-intensive cases" and were given only the clinical psychiatric examination before and after operation. The remainder received a battery of studies including clinical psychiatric study, psychologic investigation, and electroencephalographic, sociometric, and physiologic studies.

In essence this report is concerned with answering three questions: (1) What changes occur in the average patient following frontal lobe surgery? (2) How do patients who profit from surgery differ from those who fail to benefit? (3) What is the pattern of change of the group; *i. e.,* how does postoperative distribution of patients along specific dimensions relate to preoperative distribution? Of its three parts, the first concerns the plan, method, and preoperative studies; the second deals with the effects of frontal lobe surgery as approached from psychiatric, psychologic, sociologic, sociometric, physiologic, and pathologic studies; and part three is concerned with elaboration of data, discussing the relative therapeutic efficacy of several operations as well as a comprehensive theory of frontal lobe functioning.

The data presented are crisp, clear, and to the point. All the available knowledge to date is corelated and related to the study under question. This study represents a definite advance in the understanding of the relationship of the frontal lobes to schizophrenia and the effects of frontal lobe surgery.—*LEO S. MADLEM, Jr., M. D.*

BACTERIOLOGY FOR MEDICAL STUDENTS AND PRACTITIONERS, by *A.D. Gardner,* D.M. 4th edition. 271 pages; illustrated. Oxford University Press, New York, N.Y., 1953. Price $3.

The chief aim of this book in the words of the author is "to present shortly, readably, and relevantly as much of the vast subject of bacteriology as a medical student or a practitioner needs to know." Like most handbooks, however, the material in this text is necessarily restricted to an incomplete or inadequate coverage of the important facts which the physician should know. To cite a specific example, in the section dealing with antibiotics no mention is made of sensitivity tests which are currently available to the physician. The role of antibiotic therapy is covered in a few short paragraphs.

The book presents much accurate and concise information in an interesting and readable manner, and might well be considered an abbreviated copy of Topley and Wilson's *Textbook of Bacteriology.* Unfortunately no references were included in the text for the reader's guidance to the current literature.

—*DAVID F. HERSEY, First Lt., USAF (MSC)*

GIFFORD'S TEXTBOOK OF OPHTHALMOLOGY, by *Francis Heed Adler*, M.D. 5th edition. 488 pages; illustrated. W.B. Saunders Co., Philadelphia, Pa., 1953.

This is the second edition of a work which provides in a single volume a comprehensive coverage of the modern concepts of physiology of the eye and the ocular adnexa, and the clinical applications of these principles. It is a well-organized textbook for the student of ophthalmology and an excellent reference book for the practicing ophthalmologist. The general plan and organization of the book is similar to the first edition, but each section has been brought up to date to include the most recent advances in research and clinical experience.

This edition contains considerable new material in the sections on the cornea, aqueous humor, and vitreous. The physiology of the extra ocular muscles is covered more extensively than in the previous edition and contains the essence of the recent symposium on strabismus presented by the Academy of Ophthalmology and Otolaryngology. The newest concepts of visual acuity and their practical importance in refraction are well presented. The most recent work in the visual purple cycle, including that of Wald, has been included in the chapter on photochemistry. The bibliography at the end of each chapter is current and quite complete.

If an ophthalmologist were limited to ten volumes for his entire library, this book should be included.

—*FRANCIS X. WEIXEL, Maj., USAF (MC)*

FEELINGS AND EMOTIONS, by *Lawrence K. Frank*. 38 pages. Doubleday & Co., Inc., Garden City, N.Y., 1954. Price $0.85.

This pamphlet, by an acknowledged leader and expert in the field of mental health, is a model of epigrammatic writing which scientific and technical authors can well emulate when called upon to simplify their complicated subject matter for the layman. The author, with his vast background and experience in this area, together with his understanding and interpretation of new knowledge on this topic, presents an abbreviated and simplified description of the most crucial aspects of feelings and emotions in personality development, human conduct, and human living. He sketchily traces their nature and operation, and their role in the various stages of the individual's development through infancy, childhood, adolescence, and adulthood. He elaborates on the concept of emotional integrity, and offers implications of emotional reactions for living and education. He emphasizes the naturalness of affective responses and shows how we can integrate them more effectively for wholesome living.

The booklet contains no index or bibliography, nor is reference made to any other book or periodical. It can be read profitably by most laymen, students, teachers, social and medical scientists, and practitioners during an evening of relaxation.

—*FRANK KILLIAN, Jr., Lt. Col., USAF (MSC)*

SCIENCE AND MAN'S BEHAVIOR, by *Trigant Burrow*, M.D., Ph.D. 564 pages. Philosophical Library, Inc., New York, N.Y., 1953. Price $6.

In a unique and intriguing manner, the author re-examines the various scientific approaches to an interpretation of man's and society's disordered behavior. He exchanges views with 29 outstanding scientists in clarifying his new orientation to an analysis of the problem of individual and group conflict. In spite of seemingly great scientific advancements in psychologic studies, the development of ideologies, and the dissemination of information, man seems to be unable to cope adequately with a growing condition of world-wide antagonism. This book is timely, and is truly a product of the search for truth.

Dr. Burrow became dissatisfied with the stress in psychoanalysis upon individualism in human behavior, and with mechanistic interpretations in the biological sciences. He turned to organismic technics of interpretation, and the emergent evolution of group thought. The understanding and resolving of the behavior disorders of the group become essentially a community task, but the scientist must play a leading role in bringing about a reorientation because of his background and training in objective thinking.

The story of the personal struggle of the author to break his bonds of conventional thinking, the necessity of leaving his professional colleagues, and embarking upon a scientific adventure with all the elements of chance, hardship, and anxiety it entailed, is one to inspire others in their quest for truth. The re-education of groups of students to form his experimental communities produced as an end result, a pattern for subjugating autopathic ideologies and reorienting group thinking toward the production of world-wide health and universal happiness.

A glossary of 139 terms, of which 68 are those originated by the author, is included. The book is fully footnoted and includes an appendix and 26 figures. An extensive name and subject index make it a valuable reference.—*WILLIAM E. WALTON, Maj., USAF (MSC)*

AGGRESSION, HOSTILITY AND ANXIETY IN CHILDREN, by *Lauretta Bender*, M. D. 182 pages; 23 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $5.50.

Five of the seven essays in this volume, on aggression in general, attitudes toward death, suicidal preoccupation, homicidal aggression, and fire setting, are based on reports written between 1934 and 1940 by Bender, Schilder, and their associates, and deal with the case histories of 260 children at Bellevue Hospital which have been revised and expanded after 50 of their patients were the object of follow-up studies in 1950 and 1951. There would seem to be little reason for revising the original reports unless the follow-up studies revealed further understanding of the previous observations, and modification of the earlier conclusions. This appears not to have been accomplished because the

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significance of later behavior is insufficiently elaborated and what conclusions are drawn are seldom clear. The case material often seems to reflect inadequate criteria for evaluating play material and responses to a more or less standardized questionnaire given each child. What does emerge is a series of clinical impressions that might not withstand statistical scrutiny or justify sweeping generalizations and conclusions. They do, however, offer a valuable vicarious experience for those child psychiatrists whose own case material affords only occasional firsthand familiarity with children who have homicidal or suicidal histories.

It has long been a controversial question whether aggression is a primordial response equated to a "death instinct" or whether it represents more truly a life instinct in the sense of being a vital, outgoing, essentially creative force. Apparently the author subscribes to the latter view in general, but this sometimes is not clear, and through most of the papers the concept of aggression seems to carry the connotation of destructiveness and badness. The last two papers on the genesis of hostility and on anxiety in disturbed children are well worth reading and pondering over.— *JAMES N. SUSSEX, Comdr. (MC) USN*

THE NATURAL MAN, by *Clarence Leuba.* 70 pages; illustrated. Doubleday & Co., Inc., Garden City, N.Y., 1954. Price $0.95.

Mainly by inferences from field studies of men and chimpanzees, the author of this monograph attempts to explore the nature of man as unmodified by the influence of culture. He does not minimize the difficulty of this task, nor does he place too much value on the materials which are available. The conclusions are based on a review of the widely different ways of living found in various parts of the world which dispel the notion that attitudes and behavior prevalent in one's particular group are necessarily universal human characteristics. The author finds that some human characteristics are ubiquitous. These include eating, sleeping, drinking, playing, talking, living in groups, conforming to some marriage restrictions, and adherence to some kind of norms of behavior. The construction of shelter and the use of fire and some tools are characteristic of all the cultures investigated. He concludes that we will never be able to obtain an accurate estimate of the "natural" man unless specific control situations are set up and human subjects are utilized. The reviewer agrees with the author that such experimentation will probably never be undertaken due to the taboos which our own culture has set up in regard to the utilization of human beings for purely scientific exploitation. However, it is only in a culture where such taboos come into being that there is likely to be an interest in the fundamental nature of man.

This stimulating study serves as a wholesome restraint on those students of human nature who are inclined to ascribe universality to their own particular set of values and norms, and should be required reading for all who plan to make psychology and sociology their career.

—*THEODORE C. KAHN, Maj., USAF (MSC)*

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

DIGITAL PLETHYSMOGRAPHY, Introducing a Method for Recording Simultaneously the Time Course of the Rate of Blood Flow Into and Out of the Finger Tip, by *George E. Burch,* M. D., F. A. C. P., Henderson Professor of Medicine, Tulane University School of Medicine; Physician-in-Chief, Charity Hospital; Consultant in Cardiovascular Disease, Ochsner Clinic, Hotel Dieu and Mercy Hospitals; and Visiting Physician, Touro Infirmary, New Orleans. Modern Medical Monographs. 134 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $5.

ROENTGENOGRAPHIC TECHNIQUE, A Manual for Physicians, Students and Technicians, by *Darmon Artelle Rhinehart,* A. M., M. D., F. A. C. R., Emeritus Professor of Anatomy and Roentgenology, University of Arkansas; Honorary Member American Society of X-ray Technicians; Honorary Registered X-ray Technician; Roentgenologist to St. Vincent's Infirmary and the Missouri Pacific Hospitals, Little Rock, Ark. 4th edition, thoroughly revised. 454 pages; 216 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $8.50.

THORACIC SURGERY, by *Richard H. Sweet,* M. D., Associate Clinical Professor of Surgery, Harvard University Medical School. 2d edition. 381 pages; illustrations by *Jorge Rodriguez Arroyo,* M. D., Formerly Assistant in Surgical Therapeutics, University of Mexico Medical School. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $10.

LUNG CANCER, by *Seymour M. Farber,* M. D., Associate Clinical Professor of Medicine, University of California Medical School; Lecturer in Diseases of the Chest, University of California School of Public Health. American Lecture Series, Publication No. 187, A Monograph in The Bannerstone Division of American Lectures in Chest Diseases, edited by *J. Arthur Myers,* M. D., Ph. D., F. A. C. P., Professor of Medicine and Preventive Medicine and Public Health, University of Minnesota Medical School, Minneapolis, Minn. 157 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $4.75.

MAYO CLINIC DIET MANUAL, by The Committee on Dietetics of the Mayo Clinic. 2d edition. 247 pages. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $5.50.

BIOLOGY, by *Claude A. Villee,* Harvard University. 2d edition. 670 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $6.50.

IMPROVEMENT OF PATIENT CARE, A Study at Harper Hospital, by *Marion J. Wright,* R. N., M. S., Associate Director, Harper Hospital, Detroit, Mich. Published in co-operation with and under the sponsorship of the American Hospital Association. 236 pages; illustrated. G. P. Putnam's Sons, New York, N. Y., 1954.

PRINCIPLES OF VETERINARY SCIENCE, by *Frederick Brown Hadley,* D. V. M., Formerly Professor of Veterinary Science, University of Wisconsin, and Veterinarian of the Wisconsin Agricultural Experiment Station. 5th edition. 546 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $5.25.

TEXTBOOK OF ORGANIC MEDICINAL AND PHARMACEUTICAL CHEMISTRY, edited by *Charles O. Wilson,* Ph. D., Professor of Pharmaceutical Chemistry, Chairman of the Department of Pharmaceutical Chemistry, College of Pharmacy, University of Texas; and *Ole Gisvold,* Ph. D., Professor of Pharmaceutical Chemistry, Chairman of the Department of Pharmaceutical Chemistry, College of Pharmacy, University of Minnesota. Authors: *T. C. Daniels,* Ph. D., Dean of the College of Pharmacy, Professor of Pharmaceutical Chemistry, College of Pharmacy, University of California; *Robert F. Doerge,* Ph. D., Associate Professor of Pharmaceutical Chemistry, College of Pharmacy, University of Texas; *Ole Gisvold,* Ph. D., Professor of Pharmaceutical Chemistry, Chairman of the Department of Pharmaceutical Chemistry, College of Pharmacy, University of Minnesota; *W. D. Kumler,* Ph. D., Professor of Chemistry, College of Pharmacy, University of California; *Eldin V. Lynn,* Ph. D., Research Professor of Chemistry, Massachusetts College of Pharmacy; *Taito O. Soine,* Ph. D., Professor of Pharmaceutical Chemistry, College of Pharmacy, University of Minnesota; *Abraham Taub,* A. M., Professor of Pharmaceutical Chemistry, College of Pharmacy, Columbia University; *George L. Webster,* Ph. D., Professor of Chemistry, Head of the Department of Chemistry, College of Pharmacy, University of Illinois; *Charles O. Wilson,* Ph. D., Professor of Pharmaceutical Chemistry, Chairman of the Department of Pharmaceutical Chemistry, College of Pharmacy, University of Texas. 2d edition. 805 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $10.

PROBLEMS IN CONSCIOUSNESS, Transactions of the Fourth Conference, March 29, 30, and 31, 1953, Princeton, N. J., edited by *Harold A. Abramson,* M. D., Assistant Clinical Professor of Physiology, Columbia University College of Physicians and Surgeons, and Associate Attending Physician for Allergy, The Mt. Sinai Hospital, New York, N. Y. 177 pages. Sponsored by Josiah Macy Jr. Foundation, New York, N. Y., 1954. Printed by Corlies, Macy & Co., Inc., New York, N. Y. Price $3.25.

EAT, THINK AND BE SLENDER, by *Leonid Kotkin,* M. D., with the assistance of *Fred Kerner.* 223 pages. Hawthorn Books, Inc., New York, N. Y., 1954. Price $2.95.

THE TECHNIQUE OF PSYCHOTHERAPY, by *Lewis R. Wolberg,* M. D., Director, Postgraduate Center for Psychotherapy; Associate Clinical Professor of Psychiatry, New York Medical College. 869 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $14.75.

ELECTROCARDIOGRAPHY, by *E. Grey Dimond,* M. D., Professor and Chairman, Department of Medicine; Director, Cardiovascular Laboratory, University of Kansas Medical Center, Kansas City, Kans. 261 pages; 272 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $14.

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